Executive Guide to Enterprise E-Business Infrastructure in South Asia

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- A summary of the most recent research
- A guide to some of the leading information technology suppliers

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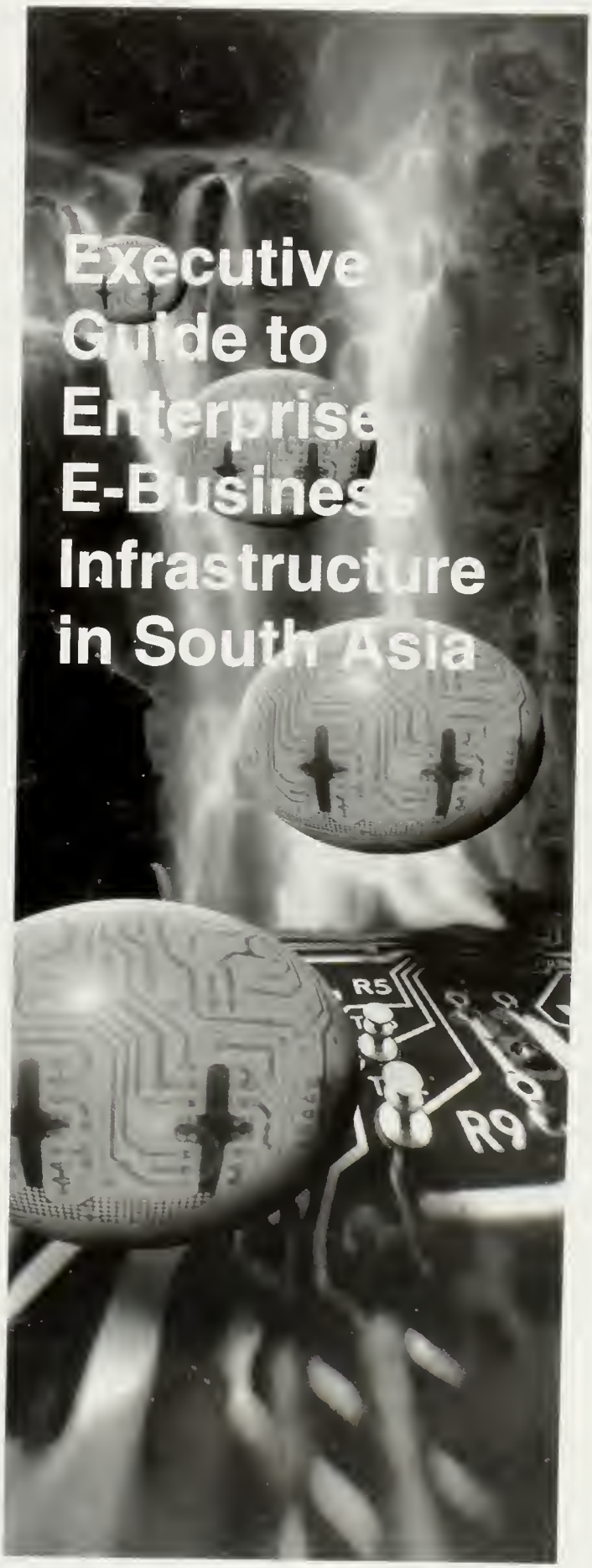

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Introduction

The Internet is changing the way business is conducted, not only in North America and Europe, but in Asia as well. Yet, most executives in South Asia are uncertain as to how these changes will affect them and unsure as to what actions they should take to address both the challenges and opportunities that these changes will bring to their organizations.

For effective E-Business, infrastructure is critically important. This Executive Guide to Enterprise E-Business Infrastructure in South Asia provides an understanding and analysis of these issues for South Asian organizations and the implications to senior management.

The focus of this Executive Guide is on providing a concise, executive-level perspective of this important topic. First, we provide an overview of the topic and issues based on discussions with senior executives. INPUT conducted a survey of 240 large and medium sized organizations, involving 40 interviews with senior executives in each of six key South Asian countries: India, Indonesia, Malaysia, Philippines, Singapore and Thailand. The first part of the Executive Guide summarizes the major findings of this survey and offers recommendations in light of these findings.

We then profile 10 selected providers of E-Business infrastructure solutions. There are hundreds of vendors offering enterprise E-Business products, services and solutions, and the 10 vendors were selected to help the reader better understand the diversity of vendors and solutions behind the growing E-Business activity in South Asia. The associated case studies provide live examples of how senior executives can gain from the solutions being offered today.

Table of Contents

Executive Summary 2

Profiles of Selected E-Business Infrastructure Solutions Providers 13

Aspect Communications 15

Astra Graphia IT 20

Baan 24

Compuware 29

Fuji Xerox 34

IBM 39

Intel 44

Microsoft 49

Novell 54

Origin 58

List of Exhibits

Will the Internet Bring Significant Changes to Your Organization and the Way It Operates? 3

Is Your Organization Putting More of a Focus on the Internet and Electronic Business? 3

Internet Components Currently in Place 4

E-Business Development Path Being Taken by South Asian Enterprises 4

E-Business Actions Being Taken 7

Implementing E-Business Solutions as a Whole or Piece-by-Piece? 8

Is Any One Department or Individual in Charge of Your E-Business Activities and Implementation? 9

Operating System Used for Web Sites in Malaysia & Singapore (June 2000) 10

Importance of Integrating Back-End Systems to Online Internet Activity 11

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Executive Summary

Intense business competition, technology, changes in the marketplace, and pressure from customers and suppliers are driving businesses to overhaul the way that they have been doing business. The Internet has accelerated the pace of that change, revolutionizing the way that businesses conduct business.

Overall, South Asia is significantly behind North America and Europe in the adoption and use of Electronic Business, although some countries are further behind than others. Poor telecommunications infrastructure and the low penetration of information technology (IT) among Asian consumers are two factors behind this.

This study found that another factor is a pervasive wait-and-see attitude among many businesses in South Asia. On one hand, most South Asian executives realize that the Internet is bringing radical changes and that they need to avoid being left behind. On the other hand, most executives are unsure as to what near-term benefits, if any, are to be obtained from investments in E-Business. As a result, most organizations are moving cautiously and carefully in their E-Business implementation.

Executives should realize that E-Business is quickly becoming an essential ingredient to doing business and that companies that are not equipped for E-Business will be at a competitive disadvantage. This will come much sooner than expected for most executives in South Asia.

Businesses can start using the Internet for information distribution, a point that leading organizations in the region have already reached. They can then graduate to offer a broader range of services. Companies need to track the interests of both customers and business partners to ensure that they do not fall behind.

Increasingly, businesses in South Asia must embrace the Internet and E-Business or risk losing their customers to new and traditional competitors leveraging new technologies.

The critically important first step to implementing E-Business is to put the necessary infrastructure in place. This involves Internet-enabling and Internet-optimizing systems, applications and processes across the organization.

Some differentiate 'infrastructure' from the data center. In this *Executive Guide*, 'E-Business Infrastructure' refers to both front-end and back-end systems.

E-Business requires a proper, enterprise-wide, Internet-optimized infrastructure. Helping senior South Asian executives understand and address this need is the focus of this *Executive Guide*.

What is E-Business?

E-Business involves integrating the Internet and Internet technologies into the enterprise and business processes. Integration is the key, as E-Business involves making the Internet and Internet technologies an integral part of the business.

E-Business is revolutionary because it not only encompasses electronic commerce, involving transactions external to the organization, but also the internal processes which need to be re-engineered around Internet-based systems and applications.

E-Business can be viewed as the embedding of Internet-based systems into a business process to create a system that would just not be possible in any other way. The openness of the Internet system enables these processes to operate in new ways and thus support the creation of new business models.

E-Business, and the implementation of E-Business, is different for each business. For some, it is about reaching out and responding to customers; or about better managing the supply chain; or about more effectively communicating with internal staff or external partners. However, for most, it is about leveraging new technologies and new ways of doing business in multiple areas and at multiple levels.

E-Business extends the value chain beyond the corporate boundaries and encompasses the full supply chain, product life and sales cycles. It includes the use of information technology for EDI, customer and product databases, electronic funds transfers, value-added networks, interactive voice-response customer service systems, sales and marketing on the Internet, electronic catalogs, and basically anything simultaneously involving technology and business.

Because E-Business involves the integration of new, and often dynamic, technologies in the enterprise, businesses need to develop infrastructures to facilitate that integration. This involves not only creating a proper technology infrastructure (systems, applications, networks, equipment) but also creating a proper business infrastructure that adapts or re-engineers business processes and structures to E-Business dynamics. For example, it is not enough to put a technology solution in place that allows customers to place orders on-line. The processes and systems need to ensure the quick and reliable fulfillment of those orders also need to be in place.

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Businesses today are faced with more competitive pressures than ever. They are under unrelenting pressure to reduce costs, yet balance this with the need to remain responsive to customers and suppliers. Companies successfully implementing E-Business are finding that customer service is still a key differentiator in today's highly competitive world. Contact center agents who respond quickly can dramatically reduce the number of abandoned transactions and make E-Business more profitable.

Now more than ever before, businesses are faced with the challenge of having to address the question: "Am I taking advantage of changes in how business is being done?"

This pressure, combined with the significant growth of E-Business and enabling technologies, is driving South Asian businesses to recognize the need to automate and coordinate the flow of information across all areas of the enterprise (front-end and back-end; customer relationship and supply chain; top-level management and front-line staff). E-Business is becoming essential for almost any business, and implementing a proper E-Business infrastructure is a key first step.

E-Business is already starting to redefine how business is done in South Asia, changing entire industries and bringing greater competitive intensity, new entrants and challenges to existing value propositions.

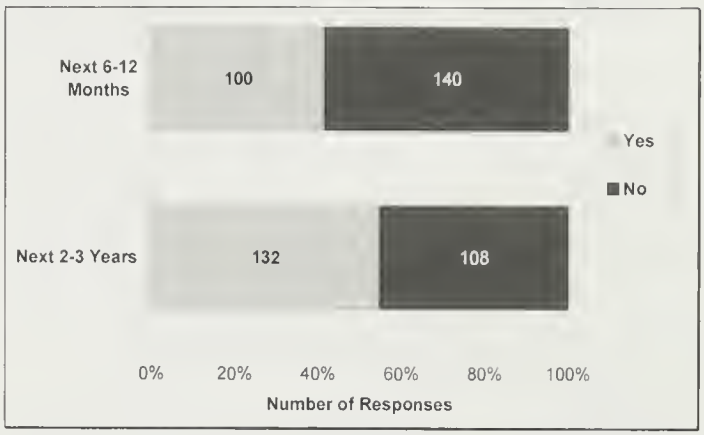
What Does E-Business Mean to Executives in South Asia?

In talking with senior executives in South Asia, INPUT encountered an interesting paradox in their views on E-Business. South Asian executives see the need to focus more effort and resources on E-Business and in building an E-Business infrastructure. However, they are also skeptical that E-Business or the Internet will bring any significant changes or tangible benefits to their organizations.

As shown in Exhibit I, most of the executives interviewed do not feel that the Internet will bring significant changes to their organization and the way it operates, especially in the short term. In contrast to executives in North America and Europe, South Asian executives feel that any changes from E-Business will be evolutionary rather than revolutionary.

Exhibit I

Will the Internet Bring Significant Changes to Your Organization and the Way It Operates?



Sample: 240 Senior IT Executives Surveyed *Source: INPUT*

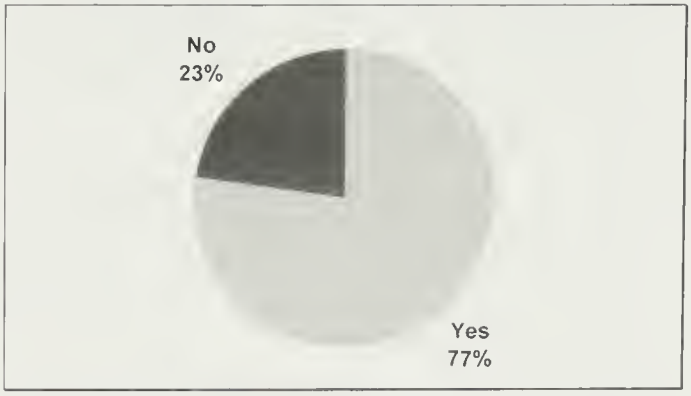
South Asian executives have been hearing a steady drum beat over the past year or two about how E-Business will revolutionize business and radically change their organization. However, so far, they have not seen much of a tangible impact on the way they or their company conducts business.

Expect this to change, and sooner than most expect. But, also expect the pace of change to be slower and less dramatic than that experienced in North America and Europe.

Although the executives surveyed do not see E-Business significantly changing their businesses, they do see advantages from E-Business and the need to focus more on leveraging these technologies.

Exhibit II

Is Your Organization Putting More of a Focus on the Internet and Electronic Business?



Sample: 240 Senior IT Executives Surveyed *Source: INPUT*

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The four most often mentioned reasons given for focusing more on E-Business were:

1. Improve business efficiency
2. Enhance customer service
3. Tap new business opportunities
4. Wider customer/geographic reach

Reasons given by those executives among the 23% that are not putting a greater focus on E-Business included:

1. Not applicable to the business
2. Focused on other priority projects
3. Watching and waiting
4. No perceived value/benefit

Broadly speaking, E-Business is seen by South Asian executives as a tool to help executives improve the efficiency and reach of their organizations but is not seen as something that is likely to revolutionize their jobs or organizations.

In implementing E-Business in their organizations, the first steps taken by South Asian executives seem to be providing email to employees and creating a corporate Web site (see Exhibit III). Most organizations are also providing Web access to employees and have an Intranet in place.

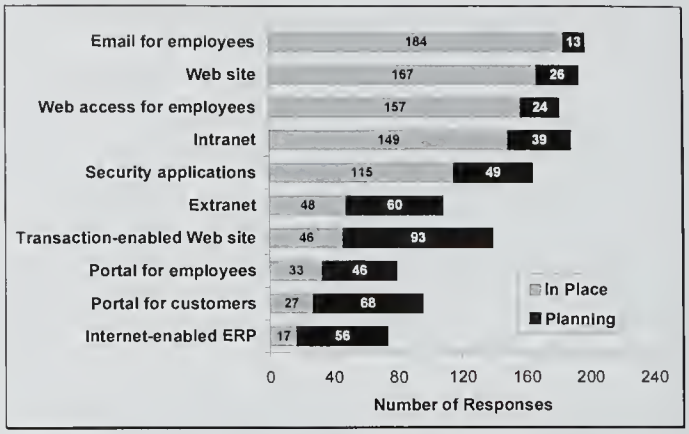
In analysing the information in Exhibit III, there are a number of points of concern regarding the development of E-Business in South Asia:

- 23% do not have email in place for their employees and 30% do not have a Web site. Those figures are remarkably high given that the survey involved larger organizations in the region.
- Less than half the organizations have security applications in place. This is especially worrying since most have a Web site and are providing Web access for employees.
- Only a handful of organizations have Internet-enabled ERP systems in place, and only about 23% have plans in this area. Businesses need to integrate E-Business throughout the enterprise in order to maximize the benefits, yet few South Asian businesses are focusing on Internet-enabled ERP systems.

On the positive side, South Asian organizations are moving beyond simple 'brochure-ware' Web sites to transaction-enabled sites, Extranets, and portals.

Exhibit III

Internet Components Currently in Place



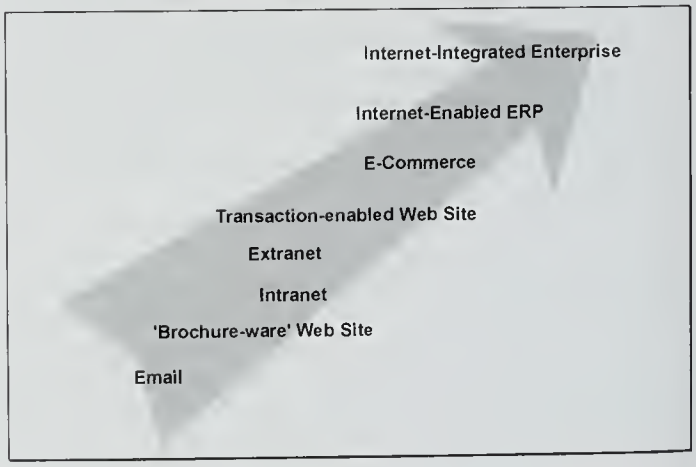
Sample: 240 Senior IT Executives Surveyed *Source: INPUT*

From initially providing employee email and developing information-oriented Web sites, South Asian organizations are slowly adding other E-Business elements and capabilities. As illustrated in Exhibit IV, they are moving along the E-Business development path towards an integrated E-Business, featuring an Internet-integrated enterprise.

Businesses in South Asia are currently about 18 to 24 months behind their North American counterparts in their E-Business development, and their pace of development lags that of North American companies. This could put South Asian businesses at a significant disadvantage, especially in industries where regional differences are evaporating more rapidly.

Exhibit IV

E-Business Development Path Being Taken by South Asian Enterprises



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India

One of the biggest challenges facing organizations in India is the country's poor telecommunications infrastructure. India is behind other countries in the region in providing employee access to the Internet, and the poor telecoms infrastructure is a key factor. On a positive note, while the telecoms infrastructure has been poor it is improving and deregulation will accelerate that trend.

The senior executives interviewed are particularly interested in E-Business as a means of reaching a wider customer base and tapping new business opportunities. In particular, many Indian businesses are looking to the Internet to help them expand, or further expand, their business activity outside India. It is this interest in the export market -- more than the domestic market -- that seems to be the driving interest in E-Business for many organizations in India.

Indian enterprises are behind others in the region in their current implementation of Internet-enabled ERP but far ahead of others in their plans to implement such systems. They are also ahead in plans for Internet-enabled Web sites.

Indonesia

While only about 20% of the senior executives interviewed in Indonesia see the Internet as having a significant short-term impact on their organizations, 80% see the Internet as having a significant long-term impact. And, 90% are putting more of a focus on the Internet and E-Business.

The driving interest in E-Business and the Internet on the part of Indonesian executives is in keeping up with the rest of the world and improving efficiency.

Indonesian businesses are ahead of others in the region in having implemented security applications and Intranets, and in their plans for transaction-enabled Web sites, portals for customers and Internet-enabled ERP.

Unfortunately, the E-Business implementation plans of many Indonesian executives are being hampered -- in some cases, severely hampered -- by budget constraints and limited corporate resources.

Malaysia

Malaysia is behind other South Asian countries in the extent to which local organizations are focusing efforts on E-Business and the Internet. Like Indonesia, budget constraints and a lack of resources are issues for many executives that feel their organizations should be doing more in this area.

Malaysian executives are especially attracted to E-Business because of the perceived benefits of enhanced customer services, improved efficiency and new business opportunities. There is also a strong interest among Malaysian executives, based on this study, in using the Internet to link with suppliers.

Malaysian businesses are ahead of others in the region in their use of security applications and Intranets, and also ahead in their plans to implement Extranets and customer portals.

Many of the executives interviewed noted that they are focusing attention on improving their Web site, and the services/capabilities offered at the site.

Philippines

The Philippines lags most other South Asian countries in the implementation of E-Business, and the future plans of Philippine organizations indicates that this is likely to continue for at least the next several years.

Executives from the Philippines were the most pessimistic about the long-term impact of the Internet and E-Business on their organization. Those that are focusing on E-Business are particularly interested in using it to improve business efficiency and enhance the corporate image.

Businesses in the Philippines are behind others in the region in Internet-enabled ERP and in plans for implementing customer or employee portals. While they are ahead in providing Web access for employees, they are behind in implementing security applications -- a potentially dangerous combination.

Singapore

Singapore businesses are ahead of other countries in their implementation of E-Business. In particular, they are ahead in having implemented email and Web access for employees, security applications and Intranets. Most have the basic elements in place and are now grappling with integrating those elements into the enterprise and improving on the components already in place.

The executives surveyed indicated that they are particularly interested in the perceived benefits of business efficiency and customer service that E-Business brings. More than in other South Asian countries, Singaporean organizations feel that a focus on E-Business is essential to maintaining competitiveness.

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Thailand

Thai companies see E-Business as providing an opportunity to gain a competitive edge and leap-frog the competition (both domestic and regional).

They are ahead of others in the region in seeing the Internet as having a significant impact on their organization, and in focusing on E-Business. Thai executives are especially attracted to E-Business because of the perceived benefits of gaining a competitive advantage, enhanced customer services, and new business opportunities.

Thai businesses are ahead of others in the region in implementing security applications, Intranets and Web sites. They are also ahead in their plans for customer portals and transaction-enabled Web sites. Interestingly, they are behind in providing email to employees.

Key Issues

In talking with South Asian senior executives, INPUT identified a number of key issues and concerns facing these executives as they look to build and develop their organization's E-Business infrastructure.

Security

A very big issue for South Asian executives, particularly IT executives, as they look to build an E-Business infrastructure is security. Ensuring that sensitive and confidential information is adequately protected is enough of a challenge when dealing with a high number of internal staff in a large organization. The challenge of protecting corporate data and systems from anyone with an Internet connection is a daunting task and at the top of the list of concerns for executives looking to implement E-Business.

Executives see the need to give customers and suppliers quick and efficient access to needed data, while at the same time protecting that data and ensuring only authorized data is accessed.

While security is certainly an important issue and a key concern, it should not be a significant factor holding back enterprises from implementing E-Business or putting a proper E-Business infrastructure in place. There are a growing number of quality security applications designed specifically to help businesses ensure a safe and secure E-Business environment.

Uncertainty

Uncertainty is another key issue affecting, and often hindering, the implementation of E-Business in South Asia. As noted above, South Asian executives are uncertain as to the tangible benefits of E-Business while weighing the need to invest significant funds and resources into building an E-Business infrastructure. Many executives are skeptical whether E-Business is more than hype and whether it will make a short-term contribution to revenues, yet they are also worried about the future impact if they are wrong.

Historically, Asian businesses have been able to observe new trends in North America and Europe and then embrace the new trends once tried and tested. However, the Internet has increased the pace of change and helped to globalize the economy. As a result, many Asian executives realize the potential risk and downfall of taking a wait-and-see attitude with E-Business.

Not only are South Asia executives uncertain whether they should invest heavily in E-Business, but they are also uncertain how to go about implementing E-Business.

Many executives are trying to gain a better understanding of E-Business so they can better evaluate its near-term and long-term impact on their business, while also trying to understand how to best go about implementing E-Business in their enterprise.

Resources

Another key concern is resources. There are two aspects to this issue.

One aspect of the issue is that many South Asian companies are budgeting little or no money for E-Business development. Many of the senior IT executives surveyed complained that they are not being given adequate budgets and resources to build and implement an E-Business infrastructure. Indonesian and Malaysian executives in particular complained that their ability to adequately address their organization's E-Business needs were hampered or hindered by inadequate budgets and resources.

One reason for the lack of budgets is the uncertainty noted above. Top management is often skeptical about the short-term benefits of E-Business and choose, instead, to focus resources on other areas where they perceive better short-term opportunities.

Another reason is that many businesses are still recovering from the regional economic crisis and are focused on improving profits by cutting costs. In many cases, companies have invested heavily in addressing the Year 2000 issue and are now looking for significant cuts in IT expenditures.

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The second aspect of this issue is that businesses are often unable to find the right skills, capabilities or expertise even if they do have the budget. This is especially a problem for companies relying primarily on in-house resources, which is one reason why INPUT recommends that South Asian businesses give careful consideration to packaged applications, third party services and outsourcing key E-Business components.

Where to Go From Here?

Realizing the strategic importance of E-Business, what action steps should businesses in South Asia take to build their enterprise E-Business infrastructures? What can be learned from the experiences of other businesses in South Asia?

The ways that organizations in South Asia are building their E-Business infrastructures are as varied as the ways they are looking to take advantage of E-Business. The most important advice to be gained from what others have done or are doing is that each business and organization must develop a plan that suits their unique needs.

Each organization needs to assess both the opportunities and challenges of E-Business to them, and then take steps to address the challenges and take advantage of the opportunities.

South Asian executives need to be aware that:

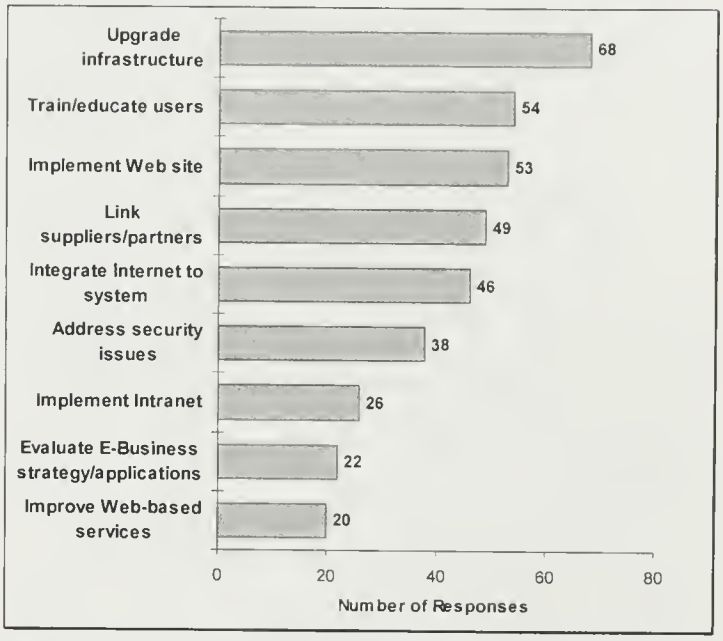
- Businesses need to begin developing and implementing E-Business strategies now.
- Businesses need to look at third party vendors able to provided the necessary skills and expertise, as the implementation of E-Business requires skills and expertise that many organizations lack internally.
- Businesses need to take a holistic approach to E-Business, integrating E-Business and E-Business components into their overall business strategy and processes.

The most common actions being taken by South Asian businesses in implementing E-Business are to upgrade their current IT infrastructure and to educate users (see Exhibit V). Both are important and essential steps in the process of integrating E-Business into the enterprise.

Putting a proper E-Business infrastructure in place is critically important to ensure that an organization has the foundation for properly addressing, implementing and leveraging E-Business. Exhibit V would indicate that South Asian businesses are realizing this and are making this a key first step in their E-Business action plans.

Exhibit V

E-Business Actions Being Taken?



Sample: 240 Senior IT Executives Surveyed *Source: INPUT*

Following are five specific recommendations on the steps and actions South Asian businesses should take in developing and pursuing E-Business and E-Business infrastructures for their organizations.

Develop an E-Business Strategy

Senior executives at any South Asian enterprise need to proactively develop an E-Business strategy and implementation plan for their organization.

First, executives need to decide what E-Business means to their organization. Will it have a significant impact or only a slight impact? Is it an opportunity or a challenge? Are competitors likely to use it to gain an advantage, or can it be used to gain an edge on competitors? Is it changing the dynamics of a company's industry?

Rather than simply ignoring this important trend, executives need to take the time to understand what is happening and take a position as to how the organization should view E-Business.

Second, South Asian executives need to develop a strategy and plan to ensure that their organization is addressing the challenges and pursuing the opportunities that it has identified. Not only does the organization need to determine where it wants to be and when it wants to be there, but it also needs to plan out how it is going to get there.

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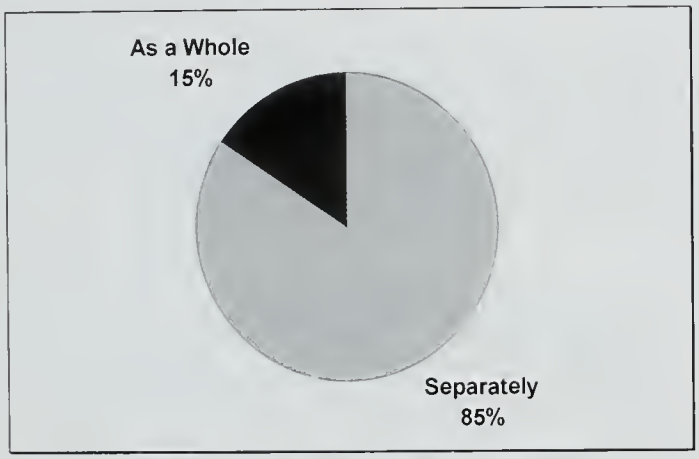
E-Business requires the development of a continuous, secure, reliable and scalable infrastructure. As part of both the strategy and its implementation, South Asian executives need to ensure that the platforms and solutions for that infrastructure are carefully and thoughtfully selected. In particular, key decisions need to be made on:

- Security solutions
- Systems management solutions
- Application server solutions

As with most organizations in South Asia, it is likely that the strategy will be implemented on a component-by-component, department-by-department or piece-by-piece basis (see Exhibit VI).

Exhibit VI

Implementing E-Business Solutions as a Whole or Piece-by-Piece?



Sample: 240 Senior IT Executives Surveyed *Source: INPUT*

Very few South Asian organizations are trying to implement E-Business solutions as a whole all at one time, and it makes sense for organizations to roll out an E-Business implementation. However, it is important for each component to be implemented within the framework of a master plan or overall strategy that ensures that the final result will be an integrated, properly structured E-Business infrastructure.

Make E-Business an Enterprise Issue, Not Just an IT Issue

The implementation of electronic commerce involves more than installing hardware and applications. It involves the integration of business strategy, processes, applications, people and technology.

Most savvy organizations are integrating their existing enterprise applications with the Internet and Internet transaction capabilities in order to:

- fully leverage their current investment in existing business systems
- manage the flow of business transactions internally and externally across their customer and supply chain
- become more "customer centric"
- become what has been identified as the "next generation enterprise" -- one that relates to its customers, suppliers, and partners via electronic means

Integrating electronic commerce transactions with enterprise-wide functions allows businesses to expand operating efficiencies beyond the enterprise. Organizations are now expecting this integration to not only help them "extend the enterprise", but to be the "price of entry" -- the strategic weapon in the arsenal of those enterprises seeking to gain a competitive advantage in a global economy that demands efficiency and rapid adjustment to market changes.

E-Business is changing the way that businesses do business. It is changing the way that an enterprise interacts with its customers, its trading partners and its own staff. As a result, E-Business needs to be viewed as an enterprise-wide initiative rather than simply an IT initiative. Enterprises today need to re-engineer themselves and their processes around E-Business in a similar fashion to the way that many enterprises have been re-engineering themselves around Enterprise Resource Planning (ERP) in recent years.

Supply Chain Management and Customer Relationship Management are two electronic commerce related initiatives that have been moving to the forefront of many corporate agendas. Current, disparate initiatives -- Supply Chain Management, Customer Relationship Management and Electronic Commerce -- must be integrated and approached holistically.

In particular, E-Business increases the need for effective customer relationship management -- both in terms of processes and systems. For example, the E-Business environment requires organizations to seamlessly and securely integrate the various silos of customer information within their organization to ensure that they are able to present a single-system image to the customer -- a daunting task for almost any organization.

Customer relationship management has become -- or, at least, should be -- a mission-critical element of any corporate strategy. A company that can personalize service to retain its most profitable customers over the long term, and then manage those long-term relationships for maximum business advantage, will have a decisive competitive edge. To be effective,

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management of the customer relationship needs to be integrated with the organization's E-Business strategy and infrastructure.

If enterprises are to achieve competitive advantage, strategic initiatives must enable efficient process exchange and be driven by common business objectives that are grounded in a thorough understanding of customer expectations.

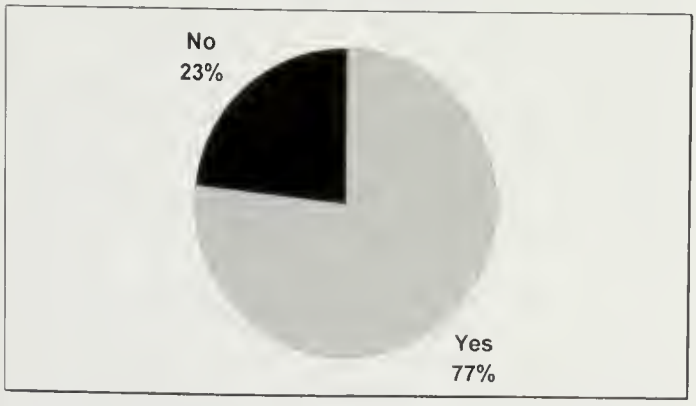
At the heart of each of these initiatives must be the interests of the customers. While there has been much discussion on how to define and evaluate customers, the most critical considerations are for companies to understand the decision criteria, decision-making processes and needs of their customers.

Related to the issue of addressing customer needs through E-Business is the need to have an E-Business infrastructure that can efficiently address the variety of customers and customer requirements. Accordingly, intelligent traffic management is an important element that should be part of the development of an E-Business infrastructure. Most organizations will have a variety of visitors to their Web site and a variety of activity/transactions taking place. It is important to be able to manage that traffic and ensure that the system responds appropriately to the different types of customers and transactions.

As shown in Exhibit VII, the E-Business activities and implementations within South Asian organizations are usually handled by one person or department, and that is usually the IT/MIS/EDP department. Most South Asian organizations are treating E-Business as an IT issue rather than an enterprise issue; as a technology concern rather than a business concern. This is a mistake.

Exhibit VII

Is Any One Department or Individual in Charge of Your E-Business Activities and Implementation?



Sample: 240 Senior IT Executives Surveyed *Source: INPUT*

INPUT recommends that organization create an E-Business task force consisting of representatives from key functions and departments, fully supported by and reporting directly to the CEO.

Act Now

South Asian businesses need to act now if they are not going to be left behind. At the very least, companies should begin dialoguing with E-Business services and solutions providers so as to better understand the benefits, costs and resources involved in implementing an E-Business infrastructure.

Companies in most industries need to begin offering the ability for customers and suppliers to interact with them electronically or risk losing market share. All companies should look at aggressively developing and implementing an E-Business strategy in order to retain existing customers and to gain access to new markets.

In developing an E-Business infrastructure, it is important to remember that system responsiveness is one of several critical factors in attracting and keeping visitors to a Web site. Once a visitor clicks on your Web site, you will often have only a few seconds to convince them to stay. Therefore, in evaluating E-Business infrastructure solutions it is important to consider the need for speed and performance. It is also important to ensure that the performance is scalable and can grow with the business and Web site traffic. It is crucial that your E-Business solutions are capable of maintaining, or restoring, server speed when running secure transactions by offloading tasks.

The dynamics of E-Business requires an infrastructure that provides intelligent network control and that delivers high levels of reliability and performance to support the transactions of end users and customers.

Businesses can start using the Internet for information distribution and then graduate to offer the full range of services, following the E-Business development path in Exhibit IV. Companies need to track their customers' interests in electronic commerce very carefully to ensure that they do not fall behind their customers' desire to use electronic commerce as a means to purchase goods and services.

Businesses must embrace the Internet and E-Business or face the risk of losing their customers to new and traditional competitors that are operating on the Web.

Executives need to realize that having E-Business capabilities will soon become mandatory, just as it has in North America. In South Asia, for example, companies who are not equipped for business-to-business electronic commerce will be at a competitive disadvantage.

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Users within a business must have access to the Internet and a well managed Web site to serve as an interface with customers and business partners.

Take Advantage of Third Party Tools, Expertise, Resources & Technology

Successful E-Business requires enterprises to carefully consider their business relationships, processes and strategies, and to effectively identify the relevant type of technologies and applications.

Small and medium sized companies in particular are encouraged to take advantage of the benefits, including lower costs and economies of scale, offered by using off-the-shelf solutions that tap existing expertise or outsourcing E-Business needs.

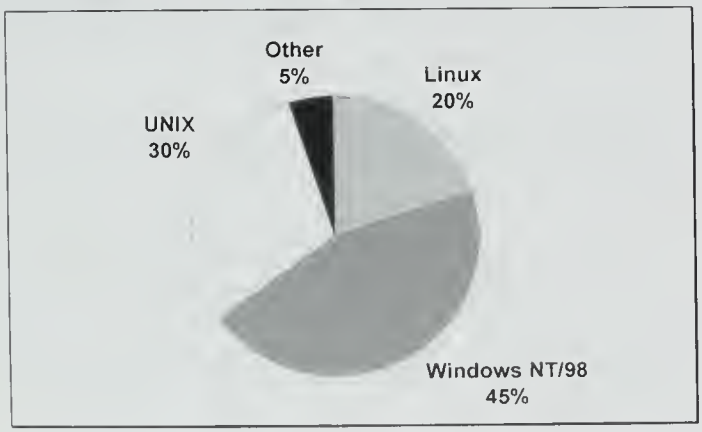
Implementing E-Business is complex because it involves applying the latest in ever changing technology as well as integrating systems, applications and technology with processes, strategies and business relationships. Embracing the latest technology a key part of effectively implementing E-Business and an E-Business infrastructure.

As a result of the complexity of building an E-Business infrastructure, the resources available in an organization's existing IT structure may not be sufficient. The skills, experience and expertise that professional service providers can offer is often required.

For example, many of the operating systems and platforms used to develop Web sites in South Asia are different from those used for enterprise applications (see Exhibit VIII). Working with new operating systems and platforms requires new skills and capabilities, and the need to tap new resources. Many in South Asia are taking the approach of sticking with more familiar operating environments.

Exhibit VIII

Operating System Used for Web Sites in Malaysia and Singapore (June 2000)



Source: Netcraft (http://www.netcraft.com)

According to data from Netcraft, Windows is the most commonly used operating system for 25,000 Web sites surveyed in Malaysia and Singapore. As noted above, sticking with established enterprise operating environments is one approach some South Asian organizations are taking to help to make the development of an E-Business infrastructure less of a challenge.

Efficiently building an E-Business infrastructure often requires that businesses take advantage of all available skills, technology, competencies and experiences in the market. Companies must not overreach themselves and take on the more complex aspects of E-Business before they are ready. Businesses should at least consider external help from consultants, software vendors, systems integrators, carriers and Internet Services Providers (ISPs) before trying to develop entirely unique in-house solutions.

The growing number of quality Web hosting services is an example of an area where organizations can reduce costs and implementation timeframes by outsourcing some elements of an E-Business infrastructure.

Upgrade Systems, Applications, Networks and Equipment

A key element in building an E-Business infrastructure is to upgrade and expand existing systems, applications, networks and equipment. As was shown in Exhibit V, this was the most commonly mentioned action being taken by the companies surveyed in implementing E-Business.

This can be a major undertaking involving changes to both packaged and legacy applications and systems, but it is also an essential step towards implementing E-Business.

When upgrading the current infrastructure, it is important to look for products and solutions that provide for rapid deployment and integration with existing networks, systems and applications. In particular, advanced networking technology can be leveraged to make the process of building an E-Business infrastructure quicker and easier. As noted earlier, scalability should also be included in the key evaluation criteria.

Executives need to look for solutions that provide an intelligent way to implement E-Business.

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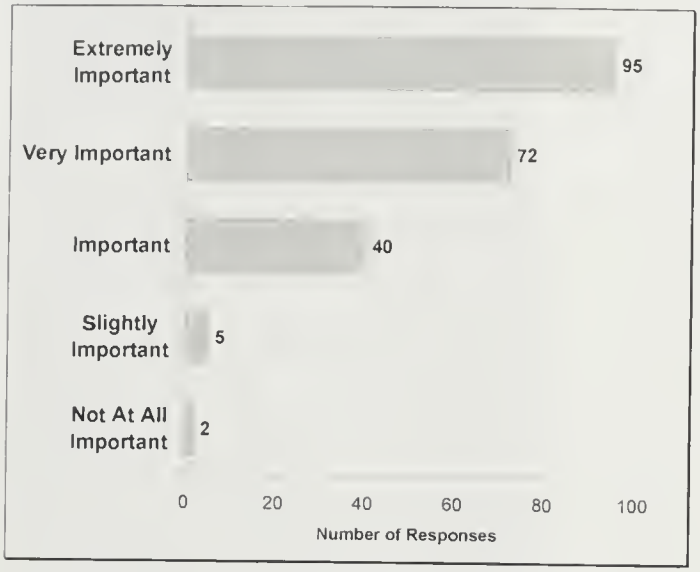
Exhibit IX

Importance of Integrating Back-End Systems to Online Internet Activity



Sample: 240 Senior IT Executives Surveyed *Source: INPUT*

One especially important area identified in this study is the integration of back-end systems to the Internet. As shown in Exhibit IX, 40% of the 240 executives surveyed said that the integration of back-end systems to the Internet is extremely important. On a scale of 1 to 5, the average rating for the importance of Internet-enabling back-end systems was 3.8.

As part of upgrading the current infrastructure, executives need to give particular attention to Internet-enabling enterprise applications and back-end systems.

Conclusion

Intense business competition, technology, changes in the marketplace, and pressure from customers and suppliers are driving businesses to overhaul the way that they have been doing business. The Internet has accelerated the pace of that change, revolutionizing the way that businesses conduct business.

Executives should realize that E-Business is quickly becoming an essential ingredient to doing business and that companies that are not equipped for E-Business will be at a competitive disadvantage. This will come much sooner than expected for most executives in South Asia.

There are certainly reasons why businesses in South Asia should be worried by current trends. In a economic world that grows smaller and more global each day, businesses in South Asia are currently about 18 to 24 months behind their North American counterparts in their E-Business development, and their pace of development lags that of North American companies. This could put South Asian businesses at a significant disadvantage, especially in industries where regional differences are evaporating more rapidly.

One factor hindering the pace of development is uncertainty. Many executives are trying to gain a better understanding of E-Business so they can better evaluate its near-term and long-term impact on their business, while also trying to understand how to best go about implementing E-Business in their enterprise.

Each organization needs to assess both the opportunities and challenges of E-Business to them, and then take steps to address the challenges and take advantage of the opportunities. Those steps should include:

1. Proactively developing an E-Business strategy and implementation plan
2. Making E-Business a corporate issue rather than an IT issue. The implementation of electronic commerce involves more than installing hardware and applications; it involves the integration of business strategy, processes, applications, people and technology.
3. Act now, or risk being left behind. At the very least, companies should begin dialoguing with E-Business services and solutions providers so as to better understand the benefits, costs and resources involved in implementing an E-Business infrastructure.
4. Take advantage of all available skills, technology, competencies and experiences in the market. Businesses should at least consider external help from consultants, software vendors, systems integrators, carriers and Internet Services Providers (ISPs) before trying to develop entirely unique in-house solutions.
5. Upgrade and expand existing systems, applications, networks and equipment. This can be a major undertaking involving changes to both packaged and legacy applications and systems, but it is also an essential step towards implementing E-Business.

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ASPECT
The Starting Point for eBusiness™ 15

PT ASTRA GRAPHIA Tbk 20

BaaN 24

COMPUWARE 29

THE DOCUMENT COMPANY
FUJI XEROX 34

IBM® 39

intel® 44

Microsoft 49

Novell® 54

origin 58

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ASPECT

The Starting Point for eBusiness™

Company Background

Aspect Communications Corporation is the leading provider of customer relationship portals, a software platform for building and deploying electronic customer relationship management (eCRM) applications that enable businesses to ensure consistent interactions with their customers from one centrally managed E-Business system. Aspect's leadership position in customer relationship management (CRM) solutions is based on their 15-year history and more than 7,600 customer contact center implementations.

Aspect Communications reported net revenues of US$489.1 million for the year ending December 31, 1999. Aspect is headquartered in San Jose, California, and has operations or presence in more than 20 countries, including Australia, China, Hong Kong, India, Japan, Malaysia, the Philippines, Singapore and Taiwan, employing more than 2,300 professionals worldwide.

Aspect's customers are companies that put a strong emphasis on their CRM strategies and desire a customer contact center that provides consistent information and consistent interactions with their customers. These companies operate within intensely competitive industries, including finance, health care, travel, retail, utilities, telecommunications and technology. Companies around the globe including Avis, Bank of Montreal, Bank United, DaimlerChrysler, E*Trade, ICT Group, PacificCare Health Systems and Thomas Cook, and a number of Asia Pacific companies, including Bank of Philippine Islands, Carlton and United Breweries, Connect IBS and Philippines Long Distance Telephone have adopted Aspect's eCRM solutions to service customers.

Aspect's products include the award-winning Aspect ® Customer Relationship Portal, along with Aspect Portal Applications, Aspect eBusiness Architect, Aspect Customer DataMart and Aspect Mission-Critical platforms. These integrate with products from leading front- and back-office vendors.

Companies are moving from traditional voice-only call centers to comprehensive mixed-media contact centers that play a central role in a company's CRM strategy. Likewise, Aspect is moving from the call center market space into the fast growing CRM market, specifically the customer relationship portal segment. Aspect already has a leadership position in this market segment, which is expected to grow nearly 85% in the next three years.

Managing Customer Relationships in the E-Business Age

The Foundation for Success

The Internet and E-Commerce have changed the very nature of business. Customers, empowered by Web browsers and e-mail, are more demanding than ever. At the same time, competition has intensified as easy access to competing products and services has eroded customer loyalty.

Successful E-Business companies are finding that customer service is still the key differentiator in this hyper-competitive world. Contact center agents who respond quickly can dramatically reduce the number of abandoned transactions and make the E-Commerce model more profitable.

CRM has risen from the tactical level of the front office to the mission-critical level of corporate strategy. A company that can personalize service to retain its most profitable customers over the long term, and then manage those long-term relationships for maximum business advantage, has a competitive edge. A company that can integrate customer data stored in isolated silos into complete customer profiles can market more effectively.

And a winning CRM strategy has to rest solidly on an eCRM solution—a solution that goes beyond traditional customer contact or customer case management applications. An eCRM solution

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accomplishes several goals front-office applications alone do not address:

- Blending telephone calls, fax, e-mail, and the Web contacts into a common queue of customer interaction.
- Integrating front-office, back-office, and contact center applications into a seamless system.
- Unifying all business functions, from sales to marketing to customer service, into a coherent process for managing profitable customer relationships.

With the Aspect Customer Relationship Portal, Aspect offers the first solution to bring together all the vital components of a successful eCRM solution in a single, integrated software package.

Aspect eCRM Solutions—the Starting Point for E-Business

Aspect Customer Relationship Portal

The Aspect Customer Relationship Portal forms the foundation for an effective E-Business system by integrating enterprise resources, coordinating customer transactions regardless of contact medium, and unifying all business functions across an enterprise.

At the initial touch points, the Aspect Portal provides customers with a consistent response, no matter what communication method they choose—telephone, fax, e-mail, and the Web. It also identifies customers so that they can be directed to the most appropriate resource, and information about them can be accessed and used to deliver superior customer service.

Customers are automatically qualified too. Those who simply want information can be directed to automated resources, while those who are ready to buy can be routed to service representatives who can close sales and look for opportunities to cross-sell and up-sell. Specifically qualified agents who serve premier customers spend their time delivering deluxe service instead of transferring calls. And several levels of service can be offered over the same infrastructure.

Finally, personalized service can be offered cost-effectively. By integrating contact channels and enterprise databases, the Aspect Portal gives service representatives quick access to information, so they know customers well enough to treat them individually.

And if a customer needs to transfer from one resource to another during a transaction, information already entered by the customer or accessed by the service representatives is instantly available to the second resource. This saves valuable time for agents and prevents frustration on the part of customers.

All this contributes to the favorable experience that builds customer loyalty. The Aspect Portal puts every step of every contact under the control of business rules, and allows a company to define the customer experience in ways that cost-effectively advance business goals.

Aspect Portal Applications

A range of software applications that perform specific eCRM tasks complements the Aspect Portal.

Aspect Portal applications for front office

Aspect Portal applications for front office are the key to consistent interaction with customers. Out-of-the-box application eFlow rules connect contact center resources with front-office applications from vendors such as Siebel, Vantive and Clarify. Data from these applications can be automatically routed to agent desktops, and softphone functionality and real-time status information on the same desktop keep agents focused and productive.

Aspect Portal Multimedia

The Aspect Portal Multimedia application enables businesses to fully integrate call center systems, e-mail response management system (ERMS), and Web interaction systems. The Multimedia application features a blending engine that monitors incoming customer interactions across all channels of communication. At the same time, it monitors the availability of resources and creates a virtual queue that blends all contacts. This enables agents to handle multiple media from a single desktop, leveling peaks on staff activity, and customers get a consistent service level no matter how they get in touch.

Aspect Web Interaction

Innovative Web interaction software makes the Web an integral part of the contact center by letting online customers interact directly with customer service representatives. Features like shared browsing, white-boarding, text chat, and collaborative form completion enable businesses to bring live customer service to E-Commerce applications, reducing transaction abandonment and turning its contact center into a cross-selling and up-selling organization that makes a positive contribution to the bottom line.

Aspect Customer E-Mail

Aspect's sophisticated e-mail response management system allows businesses to categorize incoming messages, prioritize them accordingly to content, and queue and route them to agents in its contact center

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for fast, accurate, personalized response. By integrating e-mail into its contact center, businesses can improve customer satisfaction and increase agent productivity.

Aspect Call Center Software

Aspect's industry-leading call-routing applications enable companies to route telephone calls quickly to the best available resource based on the value of each call to its business. This open, industry-standard software performs sophisticated call processing of both inbound and outbound calls and has the capacity to process up to 100,000 calls per hour.

Aspect Customer Self-Service

Aspect Customer Self-Service (CSS) allows customers to conduct transactions conveniently around the clock. While agents focus on profitable transactions, customers perform routine transactions without assistance. With CSS, a company can integrate disparate information systems and utilize resources for automated customer assistance such as interactive voice response (IVR) and fax-back. A company can also extend the range of interaction options with advanced speech recognition and text-to-speech technologies.

Aspect eWorkforce Management

Personnel account for between 60 and 70 percent of the average contact center's expense. If a contact center is overstaffed, labor costs rise and productivity falls. On the other hand, understaffing leads to poor service and thus to lost revenue—as well as agent burnout, which can also prove expensive. Aspect eWorkforce Management 2000 takes the guesswork out of staffing. It enables contact center managers to accurately predict future call volume, forecast workloads, and develop employee schedules that keep service levels high and labor costs low.

Aspect eBusiness Architect

Aspect eBusiness Architect is an intuitive graphical tool that allows businesses to rapidly develop E-Commerce and eCRM applications that strengthen customer relationships. eBusiness Architect works with a unique software engine within the Aspect Customer Relationship Portal that integrates enterprise resources and creates end-to-end processes called eFlows.

eFlows integrate individual customer transactions into coherent, centrally managed processes controlled by business rules that a company defines. They can include any channel of contact and incorporate tasks performed anywhere within the enterprise.

Aspect Customer DataMart

Aspect Customer DataMart provides businesses with an end-to-end view of each customer transaction for mining data on preferences, patterns and trends. The Aspect Customer DataMart provides fast, convenient data synthesis and analysis, enabling companies to more quickly capitalize on business strengths, identify business trends, create new sales opportunities, uncover potential business problems, and make informed business decisions while decreasing the data management and reporting burdens created by contact center and customer interaction technologies. By consolidating enterprise resources in multiple contact centers, the Aspect Customer Datamart also enables businesses to analyze multisite operations as a single, virtual contact center. This powerful functionality provides a highly informed decision-making environment, allowing businesses to identify patterns and trends in customer contact, increase the operational efficiency of each mixed-media contact center, and ultimately enhance customer satisfaction.

Aspect Mission-Critical Platforms

Mission-critical platforms are basic to a successful E-Business solution. Aspect's platforms have a long-term history of mission-critical performance. The Aspect Telephony Server, a proven call-routing platform, has as one of its key advantages the ability to handle extremely heavy call volumes at both sustained and peak loads. And Aspect's CSS Telephony Server (IVR) provides automated services capable of handling thousands of self-service transactions.

Aspect Customer Services

Aspect's Customer Services organization offers complete end-to-end strategy, design, development, implementation, training, and ongoing technical support for all Aspect's eCRM solutions. The wide range of consulting and systems integration practices augments Aspect's excellent project management, installation, education, and technical support operations, ensuring that Aspect's eCRM solutions meets businesses' needs today and tomorrow.

Aspect and Siebel Form Alliance

Aspect and Siebel formed a strategic alliance that will integrate Aspect's eWorkforce Management Portal application with Siebel's industry-leading E-Business applications. This unique, integrated offering will be available in the second half of 2000.

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In a first phase of the alliance, the two companies announced immediate availability of the out-of-the-box integration between the Aspect Customer Relationship Portal software platform and the Siebel Call Center and Siebel eService applications. Through this integration, the Aspect Portal applications for Web collaboration, e-mail and electronic service seamlessly integrate with the Siebel agent desktop and are blended with customer self-service information from Siebel eService. This integration is currently available for Lucent, Aspect and Nortel-based call centers.

Through this alliance, Aspect and Siebel's customers will be able to quickly and cost-effectively deploy an E-Business strategy that optimizes all customer relationships wherever the customer meets the business. Aspect and Siebel expect the partnership will create even stronger links between companies and customers by helping to ensure adequate staffing of skilled agents to support integrated e-mail, Web, IVR, chat and voice interactions with the customer. This joint solution ultimately offers companies increased organizational effectiveness and greater profitability through optimized staffing, while delivering superior customer service.

With the combined solution, organizations can efficiently staff their multimedia contact centers to ensure that each customer interaction is handled efficiently and by the best personnel available. Benefits of the integrated solution include:

- Real-time information that allows managers to accurately predict staffing requirements for all media types, which reduce overall staffing demands while simultaneously ensuring customer responsiveness.
- A single, integrated user interface with full multimedia workforce management capabilities, which maximizes productivity and minimizes training requirements.
- Integrated sales, marketing and service functionality allowing agents to handle any type of customer request quickly and efficiently, leading to improved customer satisfaction.

Case Studies

Bank United: Seamless Customer Service in an E-Business World

Web surfers can switch from one bank to another in a few keystrokes. Gone are the days of visiting branches all over town. They can get account information from any phone or keyboard and get banks to come to them. And they won't endure delays or confusion in solving their problems.

"Customers are impatient with the lack of coordination between business units or contact points," says Laurie Orlov, Director for E-Business applications at Forrester Research. "They don't want to repeat their account number several times between calling or other forms of contact."

For Houston-based Bank United, the mission was simple: Make contact with the customer in any manner he or she prefers, and in the customer's language. That was no small goal, but executives realized the importance of Web technology at the center of the customer experience.

"Our objective is to be always available to customers," says Wayne Sadin, Chief Information Officer for the bank. "Each of the media types has different characteristics, but each needs to work with the others. Using the integrated solution from Aspect, the bank has the power of each medium and the ability to converge all interactions into a single pool in the contact."

That convergence ensures that high-quality personnel are not wasting their time on simple queries that can be handled automatically. Bank United offers live Web chat for people completing forms online who may need help. An agent can instantly view the customer's form in real time and help complete an application more easily than answering questions by phone, ensuring that a form gets submitted instead of being abandoned.

Using tools from Aspect Communications, the bank can analyse patterns and trends in customer interaction to schedule agents better when demand is greatest. Transaction and demographic data help the bank make decisions, enabling every agent to deliver personalized service and content on demand.

"With plans to offer wireless access and video communications to the menu in the future, the infrastructure is in place for future-proofing," said Sadin.

"Aspect can grow to suit our needs, and it allows us to network our contact centers together for load-balancing and disaster recovery. We need to manage a very expensive, scarce resource—the people in the contact center—and if customers need help that only an agent can provide, they will reach an agent in the way they choose," added Sadin.

CRM Made Easy

Business processes are no longer simple exercises like requiring store clerks to make eye contact and address the customer by name. Today's companies want 24-hour access to consumers and partners,

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suppliers, and financiers, with near-immediate responses and real-time, online answers. Aspect enables this fast-forward model with Aspect eBusiness Architect.

"You can now create an application with instant information in weeks, not months," says Sudhakar Kondisetty, Senior Manager, Product Strategy and Planning, at Aspect. "Imagine how many systems need to be strung together to complete a single online transaction—from the Web site to the customer database, plus any external partner connections like suppliers and distributors. With eBusiness Architect, users can create enterprise eBusiness processes called eFlows in a visual, drag-and-drop environment and be confident that every part of it will work."

Every party to a transaction is notified as soon as the customer clicks the buy button, from the credit card company whose card was used, to suppliers of product who need to replenish inventory, to shippers who need to reserve space on the next truck.

Aspect eBusiness Architect is a tool designed to reduce costs and speed implementation. With eBusiness Architect, enterprise applications can be deployed very quickly, enabling rapid responses to changing business conditions. Aspect eBusiness Architect enables companies to integrate front-office and back-office applications with customer service, directing all customer communications according to well-defined business rules.

So, whether a call or e-mail comes in seeking support or service, or a customer wants to complete an online transaction, eBusiness Architect can facilitate the creation of all such eFlows visually. The same eFlows can incorporate any cross-sell or up-sell steps or personalization steps to keep the customer engaged.

Regardless of the information systems and despite conditions that can spread a company's operations across thousands of miles, Aspect eBusiness Architect can create a higher standard for customer service.

Some call it eCRM. Others just call it E-Business. Whatever it's called, it's a new source of cost reduction, increased productivity, and more seamless information for you and your customers.

ICT Group

ICT Group, an independent provider of call center services for sales, marketing, and customer care, employs nearly 450 professionals in management, sales, systems, and operations, and approximately 4000 telephone sales and customer service representatives as well as research interviewers.

The company manages 34 customer contact centers in the U.S., Europe, Australia and Canada, from which it supports inbound and outbound calling for domestic and multinational corporations and institutions, primarily in the financial, insurance, telecommunications, healthcare, information media, energy, and hospitality industries.

ICT's business depends upon their ability to offer top-notch service for their client's customers. ICT realized that consolidating customer contact information and bringing live customer service via the Internet into their contact centers would be a key competitive differentiator for them.

While there are many companies that offer Web shopping or service to customers, the customer service ratings of dealing with companies over the Web have been poor. ICT wanted to rise above these statistics by integrating Web service and support into their traditional contact center to enable them to provide live, personalized service.

ICT selected a solution from Aspect designed to significantly improve both the sales productivity and customer satisfaction levels of all types of customer transactions and bring them together into the existing E-Business infrastructure.

ICT began with the Aspect Customer Relationship Portal as their foundation, and then added Aspect Portal Applications to bring the e-mail and Web transactions into the contact center. By integrating their Web transactions into the Aspect Portal, ICT could take advantage of the Aspect Portal's advanced routing capabilities across multiple media. Adding Web transactions to the contact center allows ICT to offer personalized service to high-value customers that need it, so that the experience with the company is positive. In addition, being able to see where the customer has been on the Web site gives agents better opportunities for up-selling.

"We can have the customer communicate with the contact center with their second phone line, voice over IP, e-mail, or however they would like. We can do collaborative sessions and white-boarding, and push information such as the latest interest rates to the customer," said Jack Kerins, President - Management Services from ICT. "By providing all of the services and information through a central place—The Portal—we can lock in customers that might otherwise be lost."

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PT ASTRA GRAPHIA Tbk

Company Background

Astra Graphia are an Information Technology-based Business Solutions provider in Indonesia and the South Asia region. Having been in the IT industry since 1983, Astra Graphia are well known for their expertise and highly valued for their commitment and high standard of IT service delivery.

Astra Graphia offers nationwide coverage in Indonesia, with major branches in the country's 19 largest cities and 76 representative offices for technical support, service points and dealers. As a subsidiary of PT Astra International, Astra Graphia benefits from an even larger network of contacts across Indonesia and the South Asia region.

Astra Graphia was incorporated in 1976, when they took over the role of Exclusive Distributor of Xerox products and services in Indonesia from PT Astra International Inc. In 1983 Astra Graphia was appointed by Digital Equipment Corporation as the Exclusive Distributor for their products and services in Indonesia. To date Astra Graphia has an installed base of close to 1000 Alpha systems, the largest Alpha account in Indonesia.

With the reshaping of the world economy, Astra Graphia aims to be a leading IT-based business solutions provider, focusing on Document Services, Outsourcing, Printing, E-Business, Networking and Systems Integration solutions.

In 1999, Astra Graphia achieved revenues of US$ 123 million. The company's stock is traded on the Jakarta Stock Exchange and the Surabaya Stock Exchange. Astra Graphia is also the first IT company in Indonesia to offer an Employee Stock Option Plan (ESOP), re-affirming their reputation for valuing their human resources. The company employs more than 400 IT professionals, with more than 60 responsible for delivering state-of-the-art E-Business Infrastructure solutions.

Astra Graphia's key partners include – Xerox, Ericsson, Marconi, Compaq, IBM, Cisco, Microsoft, mySAP.com, 3Ntity, Singapore Technologies Telemedia.

Recent Business Developments

Astra Graphia has been given the mission to manage all IT requirements within the Astra Group companies, as well as external customers. This decision will result in a significant increase in IT resources within the company. Through this strategy, Astra Graphia is ready to leverage their core business as an IT-based Business Solutions vendor.

Astra Graphia is in the process of rewriting the company's blue print in order to become a major player in the New Economy. Astra Graphia recently redefined their business plan to focus solely on Information Technology.

Astra Graphia is the first Indonesian IT Company to obtain Lloyd's ISO 9002 Certification in the Project Management of Systems Integration and Maintenance Services of Information Technology. Astra Graphia's Document Services has also obtained ISO 9001 Certification.

E-Business Solutions and Services

In the rapidly changing marketplace, companies face important issues regarding business transition, from the traditional to the Internet driven new economy. Businesses must act now to join the new economy, thus securing their future existence and potential in the Internet age.

Astra Graphia provides complete end-to-end e-Services for business interaction processes. For specific industry requirements, Astra Graphia offers a variety of packaged solutions and services to fulfill any business requirement. Through careful, thorough studies of each business case, the Astra Graphia consultant team will discuss and recommend how their e-Services solutions integrate with the existing

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business and provide the best practice link to E-Business. With their expertise in systems integration and highly professional resources, Astra Graphia can be trusted to support all your E-Commerce initiatives.

- Where do you want to stand in the new economy?
- How do you grow your business using the Internet as a vehicle?
- How do you build your loyal community in the Internet world?
- Is online payment secure?
- Should you invest heavily in Internet infrastructure to cope with the new economy?
- How can you modernize your office productivity tools and back office applications through modest investment?

Astra Graphia can help answer all these questions, and set you on the right path for business in the new century.

Astra Graphia offers comprehensive e-Services solutions as the underlying foundation of E-Business initiatives. Their e-Services comprise:

E-Business Infrastructure Design and Capacity Planning

E-Business has drastically changed the overall infrastructure requirement. More than ever, businesses need to provide systems that are accountable, non-stop for mission-critical applications, available, flexible and secure. Astra Graphia's E-Business infrastructure consultant team can help you evaluate, design, plan and build the infrastructure for you to reliably run E-Business applications and transactions.

E-Business Infrastructure Solutions

Astra Graphia's E-Business Infrastructure Solutions are offered in a variety of different forms, depending on the size of your company. They deliver end-to-end web-enabled infrastructure that integrates both business-to business and business-to-consumer with the back-end enterprise operations for optimum business efficiency. Services are categorized into three separate areas:

User Services: The User Services component provides customers with the user interface, user experience, and community building.

Business Services: This component provides customers with certain business scenarios, such as Auction, Membership, Subscription, Shopping Cart, Product Information, e-Mall, and e-Gallery.

Transaction Services: The final component provides customers with a secure transaction platform, including Secure Electronic Transaction, Secure Socket Language, Certificate Authentication, Electronic Passport, and Payment Gateway.

Hosting Services

Astra Graphia offers a variety of standard and customized hosting services that will meet your needs now and in the future.

- **Co-location**

Astra Graphia's WEB Center facilities can help you establish your Internet presence by housing your mission-critical servers at their facilities. They provide two different types of racks (open and locked) in three different sizes (5U, half and full rack) at affordable prices. All racks are equipped with separate power grids and rack-level circuit breakers. Customers can also benefit from a whole suite of value added services, including tape backups, port monitoring, event notification services and firewall services.

- **Application hosting**

This package is suited to customers who require all the features offered in Co-location, plus additional managed services. These additions include system level monitoring, data backup and recovery and 2nd level helpdesk support on a 24*7 basis. For customers with sophisticated requirements, Astra Graphia can provide capacity and performance management and offer consulting services to meet high availability guarantees.

- **e-Application Hosting**

This package has been designed to provide complete end-to-end management of e-applications. Besides providing features offered in e-application hosting, Astra Graphia also provides application level management, such as load balancing, database backup, application and system patch where applicable.

Other e-Services available from Astra Graphia include:

- E-Commerce application development
- E-Commerce application selection
- Implementation services

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Internet Marketing Services

Web marketing should go deeper than traditional banner advertising. Internet marketing comprises various interlocking aspects from exclusive and insightful collection of information, to personalization and cataloging, to name but a few.

Astra Graphia will also examine related back office activities – such as inventory management, secure transactions and logistics – to make sure that they, as well as your companies, deliver on their words. Website visitors' behavior tracking, automated preference analysis, business intelligence, customer service, and others should be examined to enable the formulation of a complete business strategy.

Application Service Provider (ASP)

The ASP model offers end-to-end services to manage and deliver multi-application hosting service capabilities to multiple customers.

The AG-ASP team – a powerful combination of expertise from Astra Graphia in IT Systems Integration and their world class strategic partners providing applications, network infrastructures, and data-center services – provides the highest level of services for the hosted configuration, provision and operation of application service packages.

Their ASP methodology allows customers to quickly ready the applications supported by server-based hosting in the data center.

Astra Graphia's ASP will target to service all dynamic companies, enlarging their focus from the SME market to multinationals with the value proposition of the right applications, rapidly and directly implemented.

The ASP model deploys the "pay as you use" application licensing scheme, instead of having customers pay up-front for the software license, in addition to implementation and integration work required.

Moreover, a lease financing option is available for customers who prefer to pay by installment. They also provide the service element on a per user/per month basis.

ASP Application Services Offerings

- Enterprise Application

The offering will include all Enterprise Application modules such as Financials, Human Resources, CRM, ERM and SCM.

- Collaborative Application

The ASP offers online hosting services for Collaborative Office productivity suites. Available immediately, the application hosting service enables subscribers to access their Collaborative Office software over the Internet.

- Unified Messaging

Delivers advanced communications and messaging capabilities to bring benefits to the customers' business.

- E-Commerce Applications

Astra Graphia's ASP offers solutions for CRM and e-procurement, two solution areas with strong commercial appeal. The service provides a complete outsourced information system, ready-to-use over the Internet, in one easy subscription package.

Vertical Sector Competencies

Astra Graphia has been appointed by their parent company Astra International to manage all IT requirements for all of the Astra Group companies, as well as also handling all E-Commerce related business opportunities. Astra Graphia benefits from Astra International's leadership in the manufacturing industry, especially in the automotive sector, by leveraging their vast experience and expertise.

The four main areas of Astra Graphia's vertical competencies and experience are:

- Finance/Banking
- Manufacturing
- Oil, Gas & Mineral
- Telecommunications

Case Studies

Astraworld

As the largest player in Indonesia's automotive industry, with a market share of more than 50%, Astra International is fully aware of the rapidly changing trends in the global automotive industry, particularly the recent significant merger and alliance activity. The Automotive industry is changing shape to reflect the new economy model.

Realizing that customer loyalty is the most important aspect for survival in this new, highly competitive industry format, Astra International decided to establish its Astraworld 'community' concept. To better serve their large nationwide customer base,

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suppliers, and business partners, Astra International and Astra Graphia developed www.Astraworld.com, which is one of Indonesia's most comprehensive click and mortar automotive portal and E-Business sites.

Building and maintaining a community is a critical issue in a portal's success. However even more important is how to navigate and organize the huge amount of unique information available to the public. A resourceful portal with standard services such as free emails, chat, search capabilities, instant messaging is no longer enough. It's also not about high hit rates. A Portal's success depends on blending the right Internet marketing mix with in-depth quality content and Internet infrastructure. However, in the end, the most important matter is profitability.

How to achieve that success is where Astra Graphia comes into the picture. They provided expertise that integrates technology and services - making real E-Business possible for the Astraworld community. Astra Graphia believes it is vital to incorporate the right technology into the back-end business processes. For astraworld.com, they determined that one way to intensify user-portal relationships and loyalty is through a reliable, scalable E-Business platform that supports the back-office functions. At the end of the day, a portal that delivers as promised has the best chance of survival.

Layangerak.com

Layan Gerak is a service provided by Astra Graphia Document Service (AGDS) business unit to customers in Jakarta's main business district - providing them with office equipment and consumables, such as printers, faxes, paper, toner, etc. The customer calls Layan Gerak to order the goods they need, which will then be delivered on the same day or the next day at the latest.

In order to make reaching Layan Gerak easier, AGDS will open another communications channel through the Internet, which also offers the added benefit of being more reliable and accurate.

With the development of this Storefront web page, AGDS is also able to expand its geographical reach beyond Jakarta's main business area to the whole country. AGDS will utilize Astra Graphia's 54 branches throughout Indonesia, and with a slight adjustment to their business process, will ensure the capability to commit and fulfill deliveries.

Astra Graphia Information Technology (AG-IT) is not only helping with the physical logistics. AG-IT designed the Layan Gerak Strorefront, as well as other business critical web applications. But AGIT's assistance did not stop there - they also recommended detailed adjustments to AGDS' back-office processes to ensure the fulfillment process was fully supported. Such points as: Timeframe of committed delivery; Involvement of third parties; and information requirement of third-parties and branch offices all had to be taken into consideration.

APLcare.com

APL (Anugerah Pharmindo Lestari) is a leading distribution company for pharmaceutical and health products in Indonesia. In its daily operations, APL has to serve both its suppliers and customers. With 24 branches and a nationwide distribution network across Indonesia, APL needs to be fully in control of its distribution system - and have access to near real-time information to enable effective monitoring.

To better service their suppliers APL, with the assistance of AG-IT, expanded and leveraged their own Intranet to offer their suppliers access to a family Extranet. Use of this Extranet has successfully created a seamless flow of two-way information.

Customer	Type of Institution	Solutions Provided	Project Details
PT Astra International, Indonesia	Business Services	Motor Lifestyle Portal and end-to-end E-Business system	Portal, I-Marketing, Transaction System. Web site: www.astraworld.com
PT Anugerah Pharmindo Lestari, Indonesia	Pharmaceutical Distributor	Corporate Portal and Principal Logistic Control system	Portal, Extranet, Logistic Inquiry and Analysis. Web site: www.aplcare.com

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Company Background

Baan Company is a leading global provider of enterprise business solutions, with systems implemented at approximately 15,000 customer sites worldwide. Founded in The Netherlands in 1978, Baan has dual headquarters in Barneveld, The Netherlands and Herndon, Virginia, United States of America. Baan is publicly traded in The Netherlands on the Amsterdam Exchanges and in the United States on the NASDAQ stock market.

Designed to meet the growing needs of a broad range of companies, Baan enterprise solutions enable companies to continuously reduce software complexity and cost, enhance ease of use, and bring value to a company's own customers and partners. Benefiting mid-market and large-scale multinational companies alike, Baan enterprise solutions enable organizations from all industries to create a fast and efficient E-Fulfillment infrastructure, master change, drive strategic business growth, improve business processes, reduce operating complexity, and increase corporate flexibility.

Recent Business Developments

The Boards of Invensys plc and Baan Company N.V. recently announced the intention by Invensys to acquire the Baan Company.

Invensys plc is a global electronics and engineering company with their head office in London, England and over 100,000 employees. They operate globally through four divisions - Intelligent Automation, Industrial Drive Systems, Power Systems and Controls. The Invensys vision is to be the global leader in the automation and controls industry.

Invensys recently announced the formation of the Invensys Software and Systems division ("ISS") as an extension of its Sensor to Boardroom™ product strategy for becoming an integrated software and systems provider. The Baan acquisition is an important step in implementing this strategy and the combined ISS division will be a leader in the supply and development of integrated business application software. The pro forma combined division will have annual turnover of approximately US$2 billion.

Baan will continue operating under the Baan name and will compete in the open market with the full range of Baan products. Invensys is committed to a strong research and development program at Baan and the full suite of Baan products.

Integrated Business Solutions

As integration has always been a key component in the Baan solution strategy, it is no surprise that Baan offers one of the broadest sets of integrated enterprise applications, which extend beyond the enterprise to reach a company's customers and suppliers.

This comprehensive portfolio of integrated solutions includes best-in-class, component-based applications that span an organization's entire value chain, including E-Business and Web Commerce, Customer Relationship Management (CRM), Supply Chain Management (SCM), and Enterprise Resource Planning (ERP). Baan also offers a global network of support, consultancy and education services - including 11 application service providers (ASPs) partnerships, more than 200 reseller relationships and 14,000 trained consultants. This broad reach provides your company the infrastructure to achieve your goals and gain competitive advantage.

E-enable the Enterprise

With the launch of their E-Enterprise product line in April 1999, Baan Company is one of the few global business solutions providers to offer a broad set of deliverable E-Enterprise applications along with the

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supporting transaction applications that support E-Business. Baan E-Enterprise is a suite of electronic commerce products built on a common platform to extend enterprise functionality to customers, suppliers and employees. The E-Enterprise suite consists of solutions for buy- and sell-side commerce and supply chain collaboration, including E-Sales, E-Collaboration, and E-Procurement. These applications collectively help users share information and create and leverage new business processes within their extended enterprise.

In addition, Baan E-Enterprise delivers self-service capabilities for anytime access to product information and business data to increase information visibility for faster and better decision-making. These E-Commerce and collaborative tools speed cycle times, reduce costs and increase customer satisfaction and responsiveness.

Baan Enterprise Solutions

In today's fast-paced Internet economy, enterprises are under ever-increasing pressure to create integrated supply chains, enabling the seamless fulfillment of E-Business processes – from the customer sales lead to invoice and customer satisfaction. Integration across the various business domains is an absolute requirement for companies to compete effectively in the emerging business to business Internet economy. With Baan Enterprise Solutions customers can deploy a seamlessly integrated solution of different Baan products and third party products making E-Fulfillment a reality.

Baan is now able to fulfill customers' cross-company enterprise computing needs in a one-stop-shop with a set of well-integrated solutions. Each Baan Enterprise Solution application, whether stand-alone or integrated, ensures that the specific users of each component will have the best possible solution to their situation.

Some of the main components which make up Baan's Enterprise Solution include:

- BaanERP, the first ERP application to be directory enabled on Windows 2000, streamlines back office business processes
- Baan E-Enterprise for electronic procurement, collaboration and selling
- BaanSCS Demand Planner for accurate forecasting and demand planning
- BaanSCS Planner and Order Promising for operational planning and available, capable and profitable-to-promise capabilities across the supply chain
- BaanSCS Scheduler for optimized supply chain operations
- BaanFOS Sales for customer and opportunity management
- BaanBIS Data Navigator for enterprise-wide business intelligence
- BaanDEMse to dynamically model business processes to fit changing business requirements

Leveraging the new Baan OpenWorld Integration Framework

Today, some of the key issues identified with traditional integration approaches include connections that are too tight; proprietary technology; too many point-to-point interfaces; not enough relation to real world business processes; and no real notion of semantic reconciliation.

The market for business to business electronic commerce is estimated to grow to over US$1.3 trillion by 2003 according to Forrester Research - with more than 65% of this market opportunity controlled by manufacturing companies. Baan OpenWorld is the first integration framework designed specifically to help manufacturing companies collaborate across the Internet with Baan ERP to deliver higher value and profitability.

With Baan OpenWorld business partners are able to seamlessly share information and collaborate on business processes to deliver new levels of customer responsiveness. Baan has risen to the challenge of creating the technologies that will enable true E-Fulfillment.

The Baan OpenWorld integration framework, is based on eXtensible Markup Language (XML) which is the industry's most open, scalable and robust standard. Showing leadership, Baan is once again one of the first in the industry to deploy XML, allowing Baan components to communicate with each other and with external applications. It is this new integration framework which enables business processes to be integrated across multiple domains including customers, business partners, operations and suppliers, supporting Internet-based business-to-business commerce.

The Power of Baan Enterprise Solutions

With the velocity of change constantly increasing, Baan Enterprise Solutions and its well-conceived integration framework puts Baan in a perfect position to address business expectations.

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Business Process Flexibility
Market, industry and internal company dynamics force business processes to be agile and the IT infrastructure to be responsive to change. The Baan Enterprise Solution builds on the strength of Baan Dynamic Enterprise Modeler Strategy and Execution (BaanDEMse).

BaanDEMse is the next generation of Baan's innovative DEMse business modeling environment, the backbone of Baan solutions. DEMse is key to BaanSeries, and includes new technologies to expand functional depth and reach. DEMse's industry-leading graphic models, such as business control models, define relationships between entities across the value chain, linking core business strategies to the configuration, navigation and execution of business processes throughout the entire system.

Reduced Complexity
With business processes being inherently complex and dynamic and with competitive pressures heating up, companies are decreasingly tolerant of IT complexity. Baan continues to remove complexity from the customer and move it upstream. Baan is doing this by making tacit knowledge explicit through modeling, by shrink-wrapping business knowledge in best-practice models, and by productizing services and manual activities. An example of this could be the pre-assembly of hard- and software and automatic software installation. Baan Enterprise Solutions allows for a phased implementation and limits business disruption during upgrading or replacement of components.

Freedom of Choice
To provide customers maximum freedom of choice and prevent vendor lock-in, Baan has added new dimensions to their portability strategy. Baan OpenWorld is compatible with various middleware products and standards. For message transport both Microsoft Message Queuing (MSMQ) and IBM MQ-Series are supported. Through standard and published Business Object Interfaces, connectivity between Baan components and various third party products is made easier.

Investment Protection
Baan Enterprise Solutions applications often need to co-exist with systems that are already in use, either developed in-house or acquired from other vendors. Baan OpenWorld provides an integration framework, which makes it easy for existing systems and Baan Enterprise Solutions components to co-exist and collaborate in the corporate ecosystem. Furthermore, Baan minimizes the traditionally large integration effort, by providing standard BOI's and easy-to-use integration utilities.

Internet Connectivity
Baan is one of the early adopters of the XML standard, and has put it at the heart of their integration solution. This enables users to leverage the full strength of Baan Enterprise Solutions even across the Internet. With Baan E-Enterprise, Baan has delivered applications for business to business commerce that take advantage of the technology standards and enable customers to quickly deploy applications for sell side, buy side, and collaborative commerce, extending connectivity across the value chain.

Key Benefits of Baan Enterprise Solutions

Baan Enterprise Solutions gives companies the power to deliver on mass customization while reducing inventory, and decreasing fulfillment timeframes. Tight process integration and web linkage allows for faster time to market, better turnover and higher customer satisfaction.

- Accurate promised delivery dates can be fulfilled by on-line available-to-promise requests with ERP and Front Office integration
- The scheduling of supply chain practices is faster and better, and the setting of delivery dates for fulfillment becomes more realistic with supply chain integration
- Customers receive the feel good factor of a convenient 24x7 service, personalization, improved accuracy, reduced cycle times and at the same time reduced overall cost of doing business by seamless integration with E-Enterprise applications
- Enable true business process acceleration by triggering process stages across multiple sites with ERP supported with Workflow
- A single user interface across applications is provided by Worktop integration, which can also be interfaced with customer Intranets that contain all of a company's Web-based business processes.

Baan's E-Enterprise Products

Baan's E Enterprise products offer unrivaled configuration flexibility. They can either be used stand alone, in conjunction with Baan ERP as well as with other back-end solutions.

Baan E-Sales

Commerce over the Internet is projected to grow to US$327 billion in 2002. Early adopters are already reaping the rewards - increased revenue and lower

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costs. Success in business-to-business Internet commerce requires a system that provides secure, immediate access to product information and visibility of sales orders, delivery status, invoices and item availability.

Baan E-Sales enables unassisted selling with packaged integration to BaanSales and BaanERP. The Baan E-Sales solution delivers product information to customers and channel partners through multi-media catalogs. For complex sales, Baan E-Configurator is available as an add-on. Self-service lookups show order history and status and product availability. E-Sales also features a complete set of administrative tools to manage security, user personalization and catalog content. Customers have 24-hour access to negotiated pricing, inventory availability, accurate order estimates, order placement and tracking.

The key benefits of Baan E-Sales include:

- Reduced sales costs
- Expanded market reach
- Creation of new sales channels
- Accurate order entry
- Increased sales
- Improved customer satisfaction and service
- Speedier order-to-deliver process

Baan E-Collaboration

Up to 70 percent of a typical supplier base have not yet implemented traditional EDI and still rely on telephone, fax and mail to communicate with their business partners. Web technologies offer new alternatives to EDI for business document exchange. Baan E-Collaboration provides a personalized Website for business partners to interact around business documents and access real-time web reports to better synchronize supply chain activities. Baan E-Collaboration raises information visibility to speed cycle times, improve accuracy and reduce the overall cost of doing business.

Documents like purchase orders, forecasts and shipping notices are published from a BaanERP system using XML and stored in a document repository. The system notifies suppliers, customers or distributors by email and directs them to a secure Website to view, approve or import the documents into their back-end systems. For complex issues, business partners can initiate real-time interaction using Microsoft NetMeeting. Self-service lookups provide access to supplier information, purchase orders and current status, purchase order history and current balance and payment history.

The key benefits of Baan E-Collaboration are considered:

- Information visibililty throughout the enterprise
- Collaborative inventory planning for vendor managed inventory and customer managed supply
- Low-threshold alternative to EDI
- Reduced procurement costs
- Improved accuracy and speedier processes
- Better communications and service

Baan E-Procurement

Baan's aim is to automate and simplify Procurement to cut costs, shorten cycles and improve productivity.

Baan's E-Procurement product features:

- User/department personalization for custom storefronts based on role, department and business profiles
- Multi-vendor catalog with third party content that supports text, graphics, audio and video
- Integration with BaanERP for workflow approval processing
- Requisition management handles repeat orders, tracks multiple orders and enables invoice matching
- Self-service lookups to manage profiles, monitor status, review past orders and track budget balance

The key benefits of this product being:

- Better information to identify spending trends and negotiate better contracts
- Realize volume discounts
- Minimize maverick buying
- Enforce purchasing policies and control spending
- Reduce purchase order costs by as much as 80 percent
- Speed approvals and order-to-delivery cycles

Case Studies

Overland Data, Inc

Overland Data, Inc. is a global supplier of innovative data storage and storage automation solutions for computer networks. The Company's award-winning DLT LibraryXpress™ SmartScale Storage® architecture has set new standards for intelligent automated storage and scalability and established

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Overland as a leader in the mid-range tape storage market.

Overland implemented and went live on the Baan E-Sales solution in only 35 days. Overland selected Baan E-Sales to provide its business partners with a powerful Web ordering system that offers customers order and product information, and features tight integration with their fulfillment process.

"Our objectives are to increase sales and improve customer satisfaction by building an Internet commerce system that reused our existing ordering process," said Carlo Saggese, Applications Manager of Overland. "The Baan E-Sales solution offered a leading Web selling experience and packaged integration that not only leverages our core Baan ERP processes, but substantially reduced implementation risk and allowed us to go live in 35 days."

Overland uses the Baan E-Sales solution to maintain a multi-media catalog of its products and to offer the convenience of anytime/anywhere ordering to its key business partners. With the implementation successfully completed, business partners will now benefit from fast, accurate response with real-time integration to Overland's Baan ERP system for price, inventory, available to promise information, and a variety of customer self-service reports. The solution provides Overland the capacity to speed order cycles and to improve customer service.

"Today, leading companies are building more effective Internet commerce sites by tightly linking the Web ordering process with their core fulfillment systems," said Nathan Pieri, Director of Product Management for Baan E-Enterprise. "With Baan E-Sales, Overland has the ideal out-of-the-box solution to extend the power of their Baan fulfillment process to their business partners, enabling faster time-to-market and lower overall cost of ownership."

Wolverine Brass

Wolverine Brass specializes in faucets, toilet repair items, tubular drainage products and valves. The company was founded in 1896 and today provides more than 3,500 quality-plumbing products to contract plumbers.

The company successfully implemented Baan E-Sales, a key component of Baan's E-Enterprise suite of E-Business products, in less than three months. The deployment of E-Sales will enable Wolverine Brass to create a new web-based sales channel – to complement its direct sales force – while maximizing its previous investment in Baan ERP. Baan E-Sales will enable Wolverine Brass to make more than 3,000 products/product configurations available online via an interactive catalog. The new web sales channel will tie in directly to the Baan ERP (Baan IV) enterprise infrastructure that was deployed in 1999 – enabling fast and efficient E-Fulfillment across Wolverine Brass' enterprise.

"We chose Baan E-Sales because it is a natural extension to our back-end Baan infrastructure and enables us to create a new sales channel while leveraging our traditional means of selling," said Phil Bauer, Vice-President of Operations for Wolverine Brass. "The direct integration with Baan ERP means that our customers will have orders processed quickly and accurately while our production process will have constant updates of sales demand."

Baan E-sales is a complete E-Commerce solution that enables customers, among other functions, to manage security, create user personalization and maintain catalog content. With E-Sales, Wolverine Brass will be able to reduce transaction costs of its sales process, provide customers an option for ordering supplies 24 hours a day and give customers a new source of information concerning the company's products. Additional features of E-Sales that will benefit Wolverine Brass include integrated tracking information directly from a shipping Website, enhanced customer information feeds available to management and the solution's optimization to quickly process transactions. Moreover, Wolverine Brass will be able to reach out to a larger community of plumber professionals previously beyond the reach of its direct sales force.

"The three month implementation of E-Sales demonstrates Baan Company's ability to deliver an E-Fulfillment solution that meets the 'need for speed' of manufacturing companies looking to transition transactions to the Web and better compete in the New Economy," said Sheila Gibson, Senior Vice President of Global Marketing, Baan Company. "We value customers like Wolverine Brass and look forward to supporting our other ERP customers as they move transactions to the Web."

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COMPUWARE

Company Background

Compuware productivity solutions help 14,000 of the world's largest corporations more efficiently maintain and enhance their most critical business applications.

Providing immediate and measurable return on information technology investments, Compuware products and services improve quality, lower costs and increase the speed at which systems can be developed, implemented and supported.

Inclusive of pending acquisitions, Compuware employs approximately 15,000 information technology professionals worldwide.

Compuware is one of the top five largest software companies in the world. With a 97% renewal rate for software products and a coverage of 4 out of 5 Fortune 1000 companies, Compuware has achieved revenues of more than US$ 2.2 billion in the last 12 months.

E-Commerce – High Visibility, High Responsibility

Shareholders, the Board of Directors and your company's management team view successful E-Commerce implementation as a requirement for their competitive position in the marketplace.

Whether based on delivering products and services to business partners or consumers, your E-Commerce efforts mean delivering some of the most advanced, technologically complex applications in your IT portfolio. *Compuware can help.*

- Unlike other software vendors, Compuware's 27 year track record is dedicated to helping you protect and prolong the life of your most critical IT investment—the application.
- Compuware products support a wide variety of platforms, environments, languages and databases.
- Their consulting organization—one of the largest in the world—builds and manages over 28 staff-years of applications every day.
- Because of their roots in professional consulting services, Compuware develop practical software products which reflect a firsthand understanding of your needs.

As technologies evolve, Compuware helps you make the most of your application investments.

Compuware: Your E-Commerce Partner

Let your business decide. Whether you build a new application or extend your existing systems depends on many variables. There is no one-size-fits-all solution.

Should you extend your enterprise? **Yes**, if you need to leverage the scalability of your legacy applications and open them to the Internet.

Should you build from scratch? **Yes**, if you need to deploy new business functions specifically for the web.

Should you integrate web and legacy applications? **Yes**, if you need to take advantage of your proven enterprise applications and incorporate them with web-based programs.

Regardless of which method you choose to use for your E-Commerce applications, the process of application development remains the same.
Build. Test. Manage.

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Compuware's specialty is leveraging your application investment. The primary requirement for Compuware's products and services is that they must provide fast, measurable business value. Compuware's philosophy is that to deliver a solid return on investment, an application must be designed properly to work reliably *throughout* its life.

Compuware sees itself as assisting organizations to become e-ready. They initially work with the development of a company's strategic E-Commerce vision. They then undertake a thorough evaluation of technological capabilities, organizational structure and current Internet activities, to equip companies with the information needed to implement a successful E-Commerce strategy.

What this means is that Compuware can help organizations create a vision and formulate a solid plan for doing business on the Internet. Compuware's planning methodology also takes a company's competitors' E-Commerce offerings into account.

Compuware believes successfully leveraging and integrating a company's existing business critical applications is the key to an effective E-Commerce implementation. E-Commerce applications will fail if the business systems do not properly work together to bring a complete, seamless transaction to customers, suppliers, or business partners.

Compuware has successfully helped many organizations integrate their enterprise applications to deliver sound and effective E-Commerce applications. Compuware can assist an organization in planning, building, testing or managing their E-Commerce solutions.

Products and Technologies

To deliver a solid return on investment, an application must be designed properly and it must run accurately and reliably throughout its life. Compuware delivers software products to help you achieve just that.

From the earliest stages of defining requirements, to testing the application, to maintaining it in production, Compuware products help improve productivity and speed you toward successful implementation. No matter what stage the application is in, or the environment you have, their solutions help you deliver functional, reliable applications.

Advisory Solutions

If you need to be E-Commerce ready and don't know where to start, Compuware can assist with the development of your strategic E-Commerce vision. With a thorough evaluation of your technology capabilities, organizational structure and current Internet activities, Compuware can equip you with the information you need to implement a successful E-Commerce strategy.

Working with Compuware will help you create a vision and formulate a solid plan for doing business on the Internet. Compuware's expert consultants are available worldwide to assist you in building your E-Commerce site with your tools or theirs.

Strategy and Assessment: Compuware has a planning methodology to assist companies create a vision and formulate a solid plan for doing business on the worldwide web. Compuware works with clients to prepare a competitive analysis of their E-Commerce strengths in relation to others within their industry. Furthermore, a thorough architectural analysis of a company's IT environment is conducted to fully assess current capabilities and need for enterprise application integration. If deemed necessary, Compuware can also provide a cost/benefit analysis of the planned E-Commerce initiative to help justify the project.

Project Planning: Compuware has strength in project management and planning, which is leveraged in creating an E-Commerce implementation plan. An added Compuware project planning service provides assistance in the creation of an assurance plan to help make sure that adequate metrics are in place to maintain a high-quality system.

Building Solutions

Compuware Professional Services helps organizations plan their enterprise application integration and assist them in building their E-Commerce site with the development tools they already own or with a web-equipped *UNIFACE* development platform. In addition to *UNIFACE*, Compuware offers several solutions to automate the tasks associated with developing an E-Commerce application.

If you're building new interfaces or applications from scratch, you'll begin coding after the initial analysis and design is complete. Compuware lets you cut error detection and debugging time in half. *NuMega* products help developers quickly detect, diagnose and repair errors and analyze performance bottlenecks, whether the application is written in C++, Java, Visual J++ or Visual Basic. *NuMega* products can also identify which code has been tested.

If the application requires back-end processing on a database (through stored procedures) or on an S/390 server, developers can use *XPEDITER* to debug their server-based source code.

Integrate New and Old Components: *UNIFACE* provides companies with a unified graphical view of all

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the pieces of an application. With *UNIFACE*, the company defines the relationship between the components, regardless of technology, and quickly assembles them into a new application. *UNIFACE* can also be used to create new application components whether building E-Commerce applications, web-enabling existing systems or creating a web front-end to access existing legacy back-end components. *UNIFACE* provides standard component interfaces to ERP packages, legacy applications and component models.

Create New Data Interfaces: If building your E-Commerce application requires a combination of two or more existing applications, you are likely to face a data integration challenge. Perhaps you need to transform data from a DB2 to an Oracle database. *File-AID* will save you time in designing and building data interfaces for application integration. Easy-to-use products help you:

- Build interfaces between all major legacy and E-Commerce databases and file types
- Define source and target mappings
- Consolidate data from multiple heterogeneous sources
- Cleanse data prior to conversion
- Convert large volumes of data.

Testing Solutions

Automating testing processes for E-Commerce applications has become an absolute necessity. E-Commerce applications are more complex than the traditional, legacy application. Change is frequent on the Internet and can result in problems anywhere from the web browser to web server, application server, network or the mainframe.

Developing at web speed demands automation. Since testing can require at least 50% of your development resources, Compuware has a wide variety of productivity tools and IT experts to help you speed every aspect of testing.

Compuware's proven *QA*Solutions testing methodologies and experienced testing professionals will help your applications be prepared for the rigors of E-Commerce deployment. Automating the process means that application changes and errors can be handled and implemented in "net time".

Confirm the functionality of your application: Once application components are developed and assembled, you will need to perform a series of functional tests. *QA*Center can help you create object-level test scripts that exercise the application from the interface, through the key business functions, to the database and back again—across multiple platforms and servers.

After test scripts are created, *QA*Center can drive repeatable execution of your test. It provides functional validation of HTML, DHTML, Java and ActiveX controls, with specific support for Oracle NCA applications. Moreover, *QA*Center gives you the ability to capture a test script under Internet Explorer and execute the same script under Netscape, and vice versa.

Create test data: To help speed the testing process, you can encapsulate current production data from multiple sources to build your test data. By using selections from the production database, you can quickly assemble a subset of data that fully exercises the application. *File-AID* can help you build your testing baseline, even if you are using data from multiple sources. You can easily find, extract, load, repair, convert, migrate, edit and encrypt data. *File-AID* also has specialized capabilities to help you create test data that exercises new application functions and compare test data results after a test has been executed.

Manage testing and track defects: Testing your E-Commerce application requires the coordination of many steps, many testers and large test suites comprised of multi-platform components. *QA*Center provides a framework for managing the entire testing process—from design to test script execution to test results analysis.

Because web application errors can have such a significant impact on your organization, *QA*Center also provides enterprise-wide software defect and change request tracking. This functionality helps you establish a systematic method for tracking software defects—from detection through resolution and verification—that promotes the flow of information between development and QA teams.

Prepare applications for global, around-the-clock access: After you've confirmed that the application will perform as expected, it's time to prepare for implementation. You need to be confident that your systems will respond quickly to thousands of simultaneous users. The final stages of testing prior to deployment are critical.

Measure and fine-tune performance: Few business applications grow as quickly or unpredictably as Internet-based applications. Therefore, E-Commerce applications must be designed with scalability in mind. *QA*Center can help determine if your E-Commerce application will be able to handle expected traffic and deliver acceptable response times. You can alter test pace and load testing, apply predictable network activity and measure application response times across different configurations.

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Using *DBPartner*, you can proactively optimize and tune your applications—prior to production. *DBPartner* captures all SQL statements at the OCI level as they are sent to the database from a Windows application. Its tuning expert offers SQL statement analysis and enables you to experiment with alternative versions of the same SQL statement and develop unlimited "what if" scenarios. The resulting statements can be analyzed side by side under a variety of conditions, including CPU cost, I/O cost, plan cost and cardinality.

Determine the quality of your testing efforts: When you deploy your E-Commerce application, your challenge is to maintain reliability. How can you demonstrate that critical areas of your application have actually been tested? 100% test coverage is unrealistic, but how do you decide what's enough? *XPEDITER* and *NuMega* provide developers and QA specialists with the ability to:

- Identify what percent of an application and its functions were exercised and how often
- Measure relative risk points in a program, based on testing to date
- Determine the requirements for additional test data and user inputs.

Simple point-and-click navigation allows organizations to assess the riskiest points in their programs and improve the results of their testing efforts.

Quickly find and fix application errors: Inevitably, application errors will occur. It's how you respond to them that will make a difference to your business. The faster you can identify and resolve problems, the faster you can return your application to production. *NuMega* tools help you quickly identify and repair errors in Windows and Java applications; *Abend-AID* helps you immediately identify and resolve S/390 application errors. Specifically, *NuMega* and *Abend-AID* give you a central point of control for managing errors across your enterprise, enabling you to:

- Detect and log a problem
- Notify the problem-solving team when a problem has occurred
- Display detailed diagnostic information for tech support
- Provide management-level status reporting—helping you proactively solve the most important problems first and allocate resources efficiently
- Track and report on individual applications and the problem-solving process in real-time.

Data-related problems can be resolved easily with *File-AID*. You can use it to pinpoint the exact location of data problems, access that data quickly and make any necessary changes. For added security in your production environment, *File-AID* creates an audit trail of changes.

Logic problems can be resolved easily with *XPEDITER*. Programmers can view source code as it executes, trace user input and data through the program, set breakpoints and edit variable values on the fly. Once changes to source code have been identified, *XPEDITER* also offers powerful editing and syntax-checking capabilities.

Managing Solutions

Optimal response time and systems availability are especially critical for E-Commerce applications. Studies show customers will leave a preferred web site because of performance problems and often never return. Compuware's Managing Solutions assist in the planning, monitoring, managing and reporting service levels that provide crucial information for E-Commerce applications. Compuware Professional Services is a scalable solution for understanding and evaluating website performance from a customer's perspective.

Planning for Production: Compuware's Professional Services staff and suite of production testing, instrumentation, and analysis tools work to ensure applications deliver on service objectives-availability, performance and recovery. *EcoSYSTEMS* provides an overall end-to-end view of application service. This end-to-end view includes the server, network and desktop, helping organizations plan and prepare their applications for production and achieve optimal performance.

Managing Service levels in Production: Compuware's *EcoSYSTEMS* and Service Level Management Solutions offers companies the ability to monitor and manage service level events and warnings. These tools will report accurately against application availability, performance and recovery objectives.

- Managing Availability: *EcoTOOLS* provides the monitoring, management and reporting of applications availability in production.
- Managing Performance: *EcoSCOPE* provides timing information and analysis to show what is affecting an application's service level performance and degrading end user response time.
- Managing Recovery: *EcoSNAP* and *ABEND-AID* detect, diagnose and report application failures in real-time and provide the information necessary to recover quickly.

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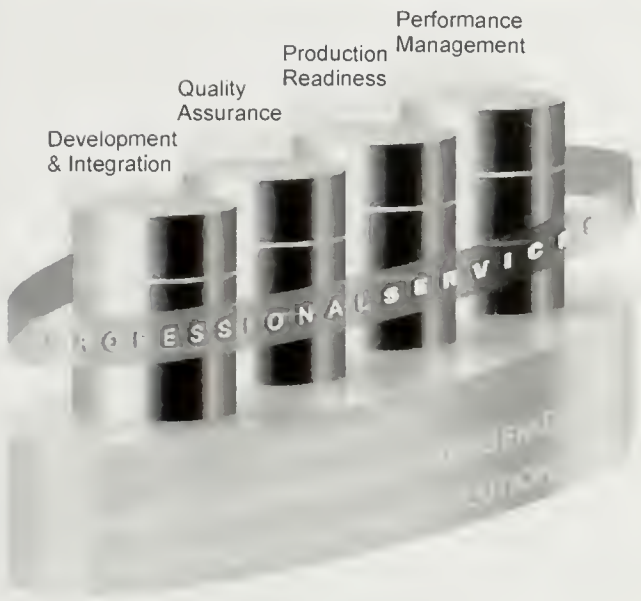

Compuware Professional Services

Compuware has the resources to provide a powerful solution to your consulting services and staff supplementation needs. With over 10,000 IT professionals working in client sites around the world, Compuware can offer you the help you need, whether you're outsourcing your entire E-Commerce project or just need an expert on a specific technology you're working with. And unlike consultants who disappear when the actual implementation looms on the horizon, Compuware have a reputation of delivering applications that work, and being accountable for the results.

Customer Testimonials

"Following a policy of automation, savings in operator resources, shortening of job turnaround time and reduction in job failure rates have all been realized. Compuware's EcoTOOLS has contributed to our success." *Sophie Lam, Assistant Director*, **Hong Kong Information Technology Services Department.**

"We are quite pleased to work with such a fine organization. We value their ability to quickly understand our business and communicate this vision to the consumer." *Whitney Vliet, Vice President New Media,* **Hallmark Entertainment.**

"...We've had a great experience working with Compuware on several projects. If someone came to me and asked who I would pick to work on an intranet project, I would strongly recommend Compuware." *Jim Smith, Intranet Webmaster,* **Johnson Controls.**

Case Study

Little Tikes

The Business

Little Tikes, a Newell Rubbermaid company, is a multinational manufacturer and marketer of a wide range of popular children's toys and juvenile products. As the fourth largest toy manufacturer, Little Tikes markets over 200 products and is the number one brand of choice for high-quality, durable toys among mothers with young children. Its red and yellow Cozy Coupe® Car, loved by millions of children around the world, celebrates its 20th anniversary this year.

The Challenge

Little Tikes partnered with Compuware on September 27, 1999 to redevelop their existing web site from concept to deployment. The first phase of the development, load testing of the site, as well as the site's entire creative look-and-feel was scheduled to go live in December 1999.

The Solution

Compuware Professional Services completely redesigned the Little Tikes web site in only 71 days. The web site now provides parents and children with product information on the company's entire line of more than 200 items.

The site provides previews of new products, expanded search capabilities, featured articles from toy experts, a BigTikesClub with special benefits, fun kid activities and purchasing information, among other features. Because of the accelerated time line for the project, the Compuware development team overlapped several jobs that usually would have taken place sequentially, including graphic design, database design, Microsoft Active Server Pages (ASP) programming, page construction and system testing.

Compuware Professional Services teams used QACenter to load test the site's production servers, the weekend before going live. Load testing with the QACenter helped determine the ultimate performance and potential limits of the system.

The teamwork of Compuware development experts, building the site, and quality assurance experts, using QACenter to load test, was a successful combination for Little Tikes. It enabled Little Tikes to deliver a reliable E-Commerce solution with significant confidence.

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THE DOCUMENT COMPANY
FUJI XEROX

The Document Company

Fuji Xerox offers unrivalled expertise in the production and management of documents; color and black and white, paper and digital, across networks, for the global enterprise. The company offers the broadest array of document solutions and services in the industry; copiers, printers, fax machines, scanners, desktop software, digital printing and publishing systems, supplies and comprehensive document-management services from the running of in-house production centers to the creation of networks.

The company adopted "The Document Company" as its corporate signature in 1994 to better reflect what has always been the real business of Fuji Xerox, document management. Fuji Xerox also adopted as its logo a stylized "X" to depict the pixels of digital imaging, the foundation of the second office revolution.

Fuji Xerox believes that because documents store, move and transform knowledge, they are critical to a business. Fuji Xerox document solutions empower the organization by offering ways to do more things with documents - whether they are digital or paper, color or black and white, networked or standalone. In addition to improving the quality of documents, Fuji Xerox solutions enable the organization to improve its business processes - reducing time and labor costs by eliminating many of the steps involved in document production.

Today, Fuji Xerox is the world's Number One document solutions provider, with worldwide revenues of US$26.2 billion in 1998. Of that, around US$6.8 billion was generated in Asia. Globally Fuji Xerox employs 122,000 people, with more than 15,000 based in the South Asia region.

Xerox Electronic Business Solutions

Fuji Xerox is traditionally known for their vast range of production printers and copiers, but as the "Document Company" they have been changing their portfolio over the last eight years to offer Document Solutions to customers. A solution would include Systems Integration, Software, Hardware, Project Management and Consultancy services, all of these are available today from Fuji Xerox. A document could be anything that conveys information and shares knowledge such as Video, Paper, Internet, Intranet, Workflow, Scanning, Printing and Faxing.

In the Asia Pacific region Fuji Xerox have customers using Archiving, Intranet/Internet, Workflow, Scanning, Formatting and Printing solutions. In all of these cases Fuji Xerox offered a business solution to meet the demands of their customers.

Many of their customers want to use this new technology but do not understand how to move forward and what direction they should take. The Fuji Xerox approach to this is to provide Document Consultancy in order that they work together to produce a Document Strategy. Many customers understand the need for a business strategy and IT strategy, but when asked about the cost of the document production and their direction they do not have anything in place.

In this profile we introduce two of Fuji Xerox's E-Business Solutions offered from their vast range of products.

In the area of customer billing the world is moving from mass production to personalized billing in order to offer additional services and increase customer retention. The *BillXChange* product is for Electronic Bill Presentment and Payment, it allows for transaction documents such as invoices, bills, and statements to be automatically published on the worldwide web. The goal is not to take the printed document and present it via the Internet but to use all the features that the Internet has to meet your business goals.

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The world is also moving from print then order to order then print. Similarly in the printing industry the *Just In Time* solution allows companies to reduce their stock levels for product manuals and other documentation by printing to order. This means that the documents that accompany your products are printed to meet your production needs. Many companies throughout the world use this Xerox solution for book production from the Internet or from your ERP system using an EDI to produce documents when they are needed.

Document Consultancy

Fuji Xerox offer customers Document Consultancy, where they will visit your company and look at the flow of the key business documents generated by your company. They will look at the way documents are created and how they are used throughout the organization, so that they can make recommendations on how these processes can be improved. At each step of the process there are checkpoints to gain agreement on the conclusions.

Many organizations come to Fuji Xerox asking for an independent study into their Document Flow, in order that they can implement a short term, medium term and long term document strategy. Some organizations are Xerox customers and others just want Xerox to help them with the headache of how to implement an effective strategy that encompasses the new Internet technology.

In the Asia-Pacific region Fuji Xerox have completed many Document Output Studies. They find that the main industries looking at E-Business technology today are telecommunications, banking, service bureau, insurance and manufacturing.

All of them have a common goal which is how can they implement a Document Strategy which enhances the use of E-Business, and how this will improve their business.

Electronic Bill Presentment & Payment

We have entered a New Convergence in which document, technology and customer service strategies roll into a single strategy for enhancing and building customer relationships that are more profitable. The emergence of Internet technologies and the growth in worldwide web usage, now require you to deliver documents when, where, and how your customers want them. These technologies have also provided a new vehicle for growing existing, and starting new, client relationships through the document with interactive applications.

Xerox *BillXchange*

Internet Delivery is not just a new way of delivering documents to customers, but provides a new way to conduct business. This means documents can be displayed on a web page, and enables the user to select hot links while viewing a document.

The Xerox *BillXchange* solution allows you to take your customers' existing legacy print applications and transform them into interactive web applications.

Internet Delivery will help you take your customer's mission-critical documents to the Internet in response to their requests without disrupting your existing print/finish/mail infrastructure or having to change your work processes.

Internet Delivery

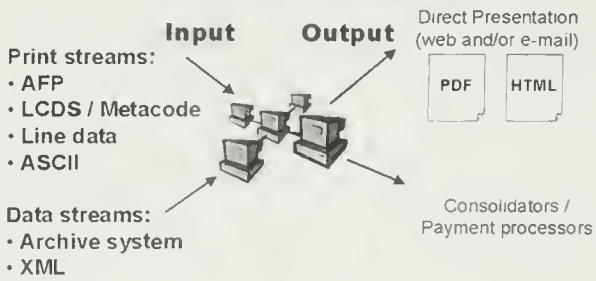
The Xerox *BillXchange* solution has the following benefits:

- **Flexibility**

Internet Delivery provides a means of adapting to and taking advantage of this fast-changing marketplace. Flexible input and output means a wide variety of customer requirements can be accommodated without huge investments. This solution is a platform upon which you can build truly unique individualized marketing campaigns to cross-sell and up-sell your most valuable, Internet-connected customers.

The output side of the solution takes into account varying requirements for delivery. If your strategy is to provide direct presentation to your customers, Xerox provide the ability to send PDFs through email or display them on the Web as a static document. Customers will be able to generate HTMLs for display at their web site. This solution provides the ability to satisfy today's different needs, as well as tomorrow's changes without modifying the print stream.

Solution Flexibility



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- **Architecture**

The *BillXchange* Server runs on a wide variety of hardware and software platforms that are scalable to guarantee high performance in mission-critical applications. The solution complies with industry standards so it easily integrates with existing web infrastructure—no need to learn new web development tools.

This solution is designed to provide the maximum flexibility to adapt to your environment rather than you adapting to Xerox'. It is delivered on an open, scalable platform with industry standard operating systems. Combine that with the ability to interface with industry standard Internet servers and web application tools, and you have a truly powerful solution. Since nothing remains the same, Xerox provide an Open C interface and API support to expand your E-Commerce presence, as well as other output media, into new applications from Xerox and other solution providers.

- **Cost Savings**

You can provide significant cost savings to your customer by increasing productivity of their call center. The center employees will have a more interactive experience with their customers. This increase in the level of customer care will also improve retention. Some immediate savings can be realized in the traditional print and mail process (paper, postage and storage).

Just In Time Product Documentation Solutions

Industry Focus

Fuji Xerox understands the competitive business of manufacturing. They understand its logistics and supply chains, as well as its goals and objectives. Now they are leveraging that knowledge with an innovative approach to the automated fulfillment of user manuals, service booklets, installation guides and other product-related documents.

Just In Time Product Documentation solutions are designed to offer:

- Just in time document manufacturing to customer order
- Documents featuring unique content composed to product builds and configurations

Manufacturing of documents can be carried out on demand and with guaranteed lead times. Thus, the need for carrying stock is removed and with it the associated costs of storage, handling and write-off for obsolete items. For instance, these efficiency gains and cost savings can help manufacturers to enter new markets, grow market share or expand their product ranges.

The Solutions

These solutions integrate industry-leading Xerox software (DocuXenter), production printers (black and white, also color) and third-party finishing equipment. As importantly, for customer-specific projects, third-party authoring and other document centric software applications can also be integrated.

DocuXenter 2.1

Xerox' DocuXenter 2.1 software package is at the heart of their *Just In Time Product Documentation solution*. Designed to enable just in time printing and finishing, DocuXenter 2.1 offers fast, predictable and high-fidelity output from a range of Xerox printers.

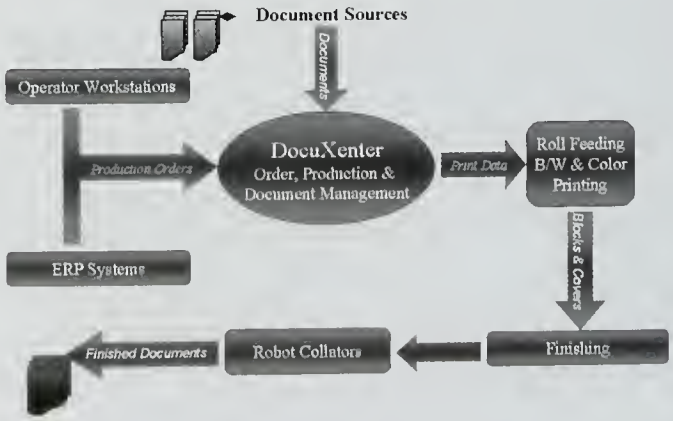
DocuXenter 2.1 also sets this Xerox solution apart from the competition as it is so well suited to automating the production of small and very small batches of documents — quantities can be as little as one. The software is Intranet enabled and supported through industry standard web browsers. DocuXenter 2.1 provides user-friendly facilities for order management, document production, and manufacturing integrity.

DocuXenter's document repository offers a heterogeneous environment for archiving. PDF, PostScript and TIFF formats can coexist. Documents are easy to submit, viewed via a web browser (e.g., click-on links to fire-up Acrobat, TIFF viewers, etc.), proofed, printed and stored.

DocuXenter Plus 2.1

DocuXenter Plus consists of the basic software and a number of optionally selected productivity modules. Each module can be tuned for a specific application.

For example, the diagram on this page shows a solution with DocuXenter at its core, receiving orders from an Enterprise Resource Planning (ERP) system and fulfilling them via automated print production lines. In fact, this solution can handle production rates of several thousand distinct orders per day with minimal operator attention.



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Productivity Modules

The productivity modules provide a powerful means of tailoring solutions to specific environments. They are:

ERP Connector: This module processes print orders generated from order processing and production planning systems (e.g., ERP systems). For example, as orders for products are entered into a customer's system, the correct quantity and document part can be automatically ordered to ensure its availability when needed. A default ERP connector is supplied with an application-programming interface to support customization.

Load Balance: Print production can be automatically load balanced across multiple print lines for optimum efficiency.

Worksheet Generator: Manufacturing and logistical information, e.g., product destination, finishing instructions, picking lists, etc., can be presented with print jobs on distinct worksheets via Worksheet Generator.

Report Accountant: This module is configurable to give production statistics. It can be viewed live in DocuXenter or exported to a spreadsheet package.

Loose Leaf Publisher: This module merges updated/new pages within a document by replacement of/addition to existing contents.

Data Insertion: Text, barcodes and personalized data from ERP orders or document properties can be inserted onto document blocks and/or covers. This module is configurable to customer requirements.

Xerox Business Services

Today, many organizations are considering the outsourcing of document management in order to concentrate on their core business. Fuji Xerox is the world leader in providing document management outsourcing. A strategic business unit of the Production Systems Group, Xerox Business Services (XBS) provides outsourced document services and solutions to over 20,000 clients in more than 50 countries, generating annual revenues in excess of US$2 billion. XBS is Fuji Xerox' fastest-growing organization, meeting the explosive increase in demand for outsourced document services and facilities management (FM), either at the customer site or offsite at a remote location. XBS also includes Xerox Professional Services which provides customized services to support enterprise IT networks.

Strategic Positioning

- Fuji Xerox have many different types of E-Business solutions
- They are flexible in their approach and use "best of breed" products to provide customers with end to end solutions
- Fuji Xerox key businesses are Documents - which can be in many different formats, including scanned image, electronic bill, video, etc. They are regarded as "The Document Company"
- Document Consultancy is used to produce document strategy for customers, integrating with their IT and Business strategy, including E-Business
- Fuji Xerox is a Global Company providing customers with Global Solutions.

Case Studies

Danfoss

Imagine a manufacturer that keeps no inventory and produces no waste. A manufacturer that customizes its product and has it ready to ship 24 hours after an order is received from anywhere in the world. In a pretty town in southern Denmark called Gråsten, you'll find just such a manufacturer — Danfoss Drives.

Danfoss, Denmark's largest manufacturing company, employs over 16,000 people worldwide, and has revenues of approximately US$1.7 billion. Danfoss supplies refrigeration, motion, heating and water controls, and at Gråsten in particular, motor drives.

A New Way to Manufacture Products — and Documents

Throughout the industry, the mass production ethic has been replaced by customized fulfillment. Like many other manufacturers, Danfoss has embraced innovative methods such as just in time production and built customized products within 24 hours of receiving a customer's order.

The weak link in the just in time chain, however, has long been producing documents to accompany customized products. In a 24-hour production environment, only 34 minutes are available to produce these essential documents. Given these requirements, and the fact that the world is shifting from traditional offset to digital, on demand printing, Danfoss sought a partner that could help them find a flexible solution — a solution that would enable them to produce the documents needed in a just in time environment.

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250 Possible Variations in 34 Minutes or Less!
After careful research, Danfoss chose to partner with Xerox. "Having tested the market for suppliers, which included Kodak, we found that Xerox was the only company that could manage the complexity of the solution," says Peter Flemming Madsen, IT Logistics Manager at Danfoss.

The challenge for Xerox was to design, deliver and manage, 24 hours a day, the complete integration between the Danfoss product manufacturing line and the production of customized manuals. The manuals had to be produced on a just in time, single order basis — all within 34 minutes!

Additionally, there were numerous product variants. Many products were rebadged for a variety of third-party customers. Since products were destined for diverse countries, documentation was needed in up to 13 languages. Further compounding and complicating the task was the fact that there might be up to 10 different document components per order. Ultimately, XBS had to have the capability to produce any of the 250 possible manual variations at any one time.

A Precedent Setting Solution
The solution was a 24-hour document production facility totally managed by XBS, Xerox' document management outsourcing division. "The trick," says Ole Buus, general manager of XBS in Denmark, "was in overall project management and careful selection and management of industry leading-edge partners."

Rolf Jaffke, XBS Production Manager at Danfoss adds, "What we knew from the beginning was that you would never succeed with a 'bolt-on' solution. In other words, to make this work, it meant that our solution had to be an integral part of the whole production line, that we at XBS had to deliver every day, 24 hours a day."

A Five-Stage, Hands-Off Process
The just in time print process is split into five stages: order, production, finishing, collation and fulfillment. When a customer places an order, it is entered into Danfoss' SAP enterprise resource planning system. The integrated production planning module then assembles and builds a unique bill of materials, including all user manuals. When the product clears its final quality check, a unique bar-coded label is scanned. This triggers the start of round-the-clock document printing and production.

The appropriate completed manuals are automatically printed, bound, trimmed, collated into sets and dropped into the box with the product within 34 minutes. "The whole process happens with absolutely no human intervention," adds Jaffke. "So the stakes are obvious and chilling — if your part of the process goes down, the whole production stops and vice versa, so you could say we are totally dependent on each other!"

The Xerox DocuXenter 400 print-on-demand software application supports this solution for manufacturing just in time product documentation. DocuXenter 400 administers print orders from receipt, through all the processes, to when the manuals are dropped into the box with the product. It also integrates all the supplies software, linking it directly into Danfoss' production systems. All Danfoss manuals are stored electronically and printed on one of four high-end print lines.

Fully automated quality checks are carried out on-line by matching the barcode on the color covers to the barcode on the contents prior to binding. A customized conveyor system transports bound manuals to the trimming and drilling stations via a series of barcode readers.

At the same time, A3 quick reference guides are produced on a 4230 black and white printer, then folded and transported to the Document Collation Robot with other completed elements. The final stage of fulfillment is seamless. When the product arrives in its box, the barcode is read. This identifies the matching documentation order and instructs the robot to pick, convey and drop the documents into the waiting box. The fully customized product is complete and continues on to the dispatch area, where it is sealed and shipped. Just in time with no human intervention!

Partnering for Success
XBS worked with a number of co-suppliers to ensure that the many components of this solution would come together.

Danfoss is clearly reaping the rewards: "This overall production and systems integrated solution is a world first," says Peter Flemming Madsen. "Not only is it highly productive, but it also allows us to make considerable year-on-year growth within our existing markets. After all, having an integrated print solution, which is totally managed and maintained by XBS, leaves us to focus on what we are best at — our core business."

Many other Fuji Xerox case studies – including those for Oracle, Ericsson, Agouron and Basingstoke Press – can be found at the following website:

http://www.xerox.com/go/xrx/industry_solutions/IndustryDetail.jsp.

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Company Background

IBM is the world's largest information technology company with 80 years of leadership in helping businesses innovate. The company creates, develops and manufactures computer systems, software, networking systems, storage devices and microelectronics. IBM also has the E-Business expertise that combines forward-thinking, creative problem solving, innovative technologies and proven implementation skills, to deliver the right innovative E-Business solutions that generate real business results and competitive advantage in the new global economy.

e-business

The company's 225,000 employees provide expertise within specific industries, as well as consulting services, systems integration, solution development and technical support. Highly regarded for consistently translating the most advanced technologies into the greatest values for their customers, IBM can help you integrate existing systems and new decision tools across your enterprise, worldwide. For example, IBM is the largest provider of server computers in the industry, offering a broad range of products that feature the performance, reliability and scalability required by companies of any size.

E-Business Infrastructure Services

Introduction

An E-Business is a company that can adapt to constant and continual change. To manage transitions smoothly, according to IBM, you have to remember two important ideas:

- Start simple, but plan to grow fast.
- Build on what you have.

It's about business, not technology. E-Business is not about re-inventing your business. It is about streamlining your current business processes to improve operating efficiencies, which in turn will strengthen the value you provide to customers — value that cannot be generated by any other means, and value that will give businesses a serious advantage over their competition.

Whether you're just starting to take the first steps or are already engaged in E-Business, taking full advantage of the opportunities E-Business can present requires planning — and this is where IBM can help.

IBM experts have a deep understanding of your business needs and the skills and resources to design, implement, and maintain superior solutions — solutions designed to deliver on the promise and potential of E-Business.

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Proactive E-Business is good business

To be successful, your E-Business must not only be scalable, reliable and secure, but cost-effective. When you guard against system problems - such as long response times - customers will rely on you. The foundation for that customer satisfaction is a responsive infrastructure.

IBM Enablement Services for E-Business offer planning, consulting, testing and continuity services to help build a stable IT infrastructure. IBM can help you run your E-Business.

IBM IT consultants have been planning infrastructures for over 25 years. IBM Global Services specialists can analyze your goals and IT requirements and then recommend E-Business solutions.

E-Business Infrastructure Assessments

Whenever end-to-end availability is critical to your business, or a new application is scheduled to go online, or you are experiencing availability issues and can't determine the cause, IBM Global Services has a suite of services that can help.

IBM offer performance management and capacity planning, testing, systems management consulting and high availability services that can be tailored to meet your specific availability requirements.

IBM Network Consulting and Integration

In today's rapidly changing networking environment, you may face many complex challenges as you implement business solutions and address your end-to-end networking assessment, strategy, architecture, design, planning, implementation and operational support requirements. Whether you lack the necessary in-house resources or would rather use the resources you do have on other projects, IBM can help.

IBM's Networking Consulting and Integration services can provide you with the networking lifecycle expertise you need to address your business and technology requirements. Their consulting and integration specialists are skilled in information and networking technologies for IBM and other vendors (e.g., Cisco, Nortel, 3Com, etc.). They use proven methodologies based on experience gained from performing successful engagements in a wide range of industries. They have access to vast repositories of networking knowledge and best practices for end-to-end networking services. With these resources, IBM can help you create the networking infrastructure you need to enable your E-Business strategy and to support your future growth.

IBM Performance Management and Capacity Planning Services

Your E-Business initiative depends on the supporting framework. As demand for your E-Business solutions grows, you want to be confident your system can sustain increased activity.

You can correct problems before your customers experience them. With years of experience in the computer industry, IBM can help you foresee future capacity requirements with IBM Performance Management and Capacity Planning Services. Their consultants have experience with multi-vendor hardware and software environments, and specialize in the modeling tools and techniques necessary to analyze your network, application and systems.

These services maximize the benefits you receive from your E-Business environment by providing a system you can rely on to support the functions and services you offer your customers.

IBM Testing Services for E-Business

Slow response times, poor performance and outages are regular occurrences in many network systems. However, you can help safeguard your system against these incidents by planning for increased volume and activity levels. Before you launch your E-Business initiative, you must be sure your system provides efficient, effective service to your customers.

IBM Testing Services for E-Business offers testing facilities that house multi-vendor equipment that can be used to simulate your environment. IBM apply customized capacity, performance and security tests to diagnose problem areas before they have a chance to surface in your live environment. And they recommend the software and hardware requirements your system needs to support predicted activity levels. As you tune your system to handle higher stress levels, IBM test those changes to ensure they function properly.

IBM Security and Privacy Services

Credit card numbers, personnel records and account numbers will inevitably be transferred over the Internet when you launch your E-Business initiative. Protecting this highly sensitive information is one of the biggest fears organizations have in conducting business over the Internet.

IBM Security and Privacy Services offer services, such as workshops, assessments, security architecture, ethical hacking and emergency response, to help you manage a company wide privacy program, to keep your information secure and to help prevent others from infecting your system with viruses. These

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services contribute to a security-rich environment that keeps outsiders from accessing sensitive information, as well as meeting the growing privacy market requirements.

IBM High Availability Services

As your customers come to rely on the E-Business services you provide, they expect system availability around the clock. When your Internet services are down, your customers are a click away from your competitors.

IBM High Availability Services help you run a trusted infrastructure by identifying your mission-critical systems and developing methods for stabilizing and protecting them. IBM address improvement areas in system components and processes, and recommend data backup and redundant hardware that can keep your vital processes running should a problem occur.

Storage Area Networks

Storage area network (SAN) technology can help expand your company's business opportunities and competitiveness through better access to business data. However, using SAN to gain access to data across complex, multi-vendor networks requires experienced, knowledgeable professionals to assess, design and install an efficient configuration.

IBM Global Services offers a wide array of SAN services to help your business succeed in today's data-intensive, multi-vendor environment. IBM can help integrate complex networks and storage systems into cohesive, responsive, cost-effective SAN solutions, implementing and supporting both IBM and non-IBM environments.

Asset Services

Knowing where your distributed IT assets are and keeping tabs on your total cost of ownership can be a daunting challenge. With their team of IBM Asset Services professionals, you can lower your IT management costs and make informed business decisions about your infrastructure. IBM can work with you to assess, design, implement and run an asset management solution that focuses on increasing IT business value.

IBM Help Desk Services for E-Business Enablement

Your E-Business initiative will need support organizations that can work with the software used in your IT environment. IBM Help Desk Services provide the following:

- Assessment – IBM review your environment, service options, and your current help desk to offer solutions that fit your needs
- Planning and Design - IBM present a solution that incorporates the necessary resources to support your choice
- Implementation - IBM install help desk components and train your staff to use them effectively
- Remote support - representatives in IBM's call center help you resolve any integration problems.

WizOffice.com & IBM

WizOffice.com (www.wizoffice.com), a business-to-business E-Commerce company which provides businesses with a complete suite of Internet-based products, services and solutions, will be partnering IBM in an aggressive strategy to reach out to SMEs in the Asia-Pacific region.

As an authorized IBM Business Partner, WizOffice will be offering attractive promotions through its online ordering system to help SMEs get on the Net.

According to Raphael Tham, CEO of WizOffice.com, "Companies sign on with WizOffice because they see tangible returns. During the last 7 months, 9,900 companies have signed on. They include SMEs which currently comprise 70-80 per cent of our clientele, as well as some Fortune 500 companies."

This alliance provides companies with a seamless means to proactively develop and rapidly implement innovative E-Business solutions. Both IBM and WizOffice share a common vision to help SMEs gain a competitive edge in the Internet age. With this partnership, IBM will work with WizOffice to combine expertise and deliver affordable and accessible E-Business solutions to SMEs in the Asia-Pacific region.

The Singapore market alone, however, is too small for WizOffice, which was voted the "Best E-Commerce Company" at the Internet World Asia Industry Awards 2000. The company plans to expand to Hong Kong, Japan, Taiwan, Korea, Australia, Malaysia and Indonesia by the end of 2000.

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Case Studies

Rediff.com

On August 15, 1998, one Indian Internet company created a milestone. Rediff.com launched the first Web store to accept online payments using rupee-based credit cards issued by Indian financial institutions. Electronic commerce had finally arrived in India. Two years earlier, when the Internet was still in its infancy in the country, Rediff.com was among the first to offer online news, information and entertainment services. Since then, the company has grown at an extraordinary pace.

Every month 1.2 million visitors beat a path to www.rediff.com, which is powered by a range of IBM E-Business technologies, including IBM Net.Commerce, IBM DB2 Universal Database and IBM HTTP Server. Interestingly, more than 65 percent of the 70 million monthly hits to the Web site are from Internet users in the United States. "For Indians and India enthusiasts worldwide, Rediff.com showcases the best India has to offer in literature, music, entertainment and tourism," claims Chief Executive Officer Ajit Balakrishnan.

There is substance in that claim. In the first six months, revenue from online trade climbed to 40 percent of total revenue, with the rest generated through banner ads, even though anxiety about Internet security has contained the look-to-buy ratio between five to ten percent. "Over the next two years, we expect online trade to account for 80 percent of our revenues," says a confident Balakrishnan. A confidence well-founded, he says, because of the great care the company has taken in ensuring online security. "We could not risk any security problems," says Balakrishnan. "A security breach in our system could have set back E-Commerce in this country a few years — and that is no exaggeration. It's the reason we selected the IBM E-Business solution." IBM HTTP Server supports industry-standard Secure Sockets Layer (SSL) encryption, helping maintain the security of information transmitted over the Web. Customers are obviously convinced. Of the approximately two million credit card holders in India, 30,000 are already customers of Rediff.com, an impressive adoption rate by Indian standards.

The Web store isn't designed just for the Internet-savvy user, but also first-time "mom and pop users whose kids probably know more about computers than they do," says Balakrishnan. For example, the store offers live customer service — just click on the icon and a chat window opens, allowing customers to ask questions and receive instant responses from service representatives. The result is quality customer service at a low cost. Balakrishnan explains, "In a country where the concept of online ordering is new, this makes a big difference. We have personnel responding to customer queries around the clock. This is much cheaper than setting up a call center help line." Indeed, the impact of this personalized service on the bottom line was evident immediately. "Online orders grew almost 50 percent as soon as we launched live customer service," says Balakrishnan.

The one-stop online shop

So, what are the crowds flocking to at Rediff.com? The most frequented destination is the music store, which carries 45,000 music titles from nearly 100 categories of Indian music-classical, pop, folk songs, devotional songs, music for festivals and more, in 14 Indian languages — as well as 27 categories of international music. Shoppers can listen to 50-second snippets of a music score before they place an order. The Rediff.com book shop catalogs 125,000 book titles, and the gift shop displays more than five goodies visitors can buy and have delivered to friends and relatives around the world. Orders are shipped within seven days worldwide by Federal Express.

There's something for everyone at this Web store. Tourists can make hotel reservations in 60 Indian cities using Rediff.com's online reservation services. Students visiting the site's education service can get valuable information about schools and programs. A movie ticketing service allows visitors to buy tickets and even select seats for theaters in Mumbai. Just the other day, a chat session with Indian cricket star, Sachin Tendulkar, attracted 8,000 participants, mainly from California, Balakrishnan enthuses. "We arranged for him to autograph copies of a new book, The Making of a Cricketer, and while he chatted online, we sold 700 copies in one night.

Delivering all these features and services would require considerable time and development effort, right? Not really. "Net.Commerce is a flexible tool. Every store is different in the way it treats its customers, and Net.Commerce accommodates that very well," says Balakrishnan. "The Net.Data macros made it possible for us to customize the Web site relatively easily and quickly." Net.Commerce delivers everything needed to run the store, including a shopping cart, online catalog and special offers.

Technology that grows with the business

This is only the beginning. Recently, the Internet service provider (ISP) business in India was opened to private business. With more private participation, 1.5 million people are expected to come online by March 2000. "If there are one million Indians online by the end of 1999, our aim is to attract at least 30 to 40 percent of them to make purchases worth at least 50 rupees from our online store, at least once," says Balakrishnan. That would add up to more than

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U.S.$400,000! Ambitious? Maybe, "but not improbable," quips Balakrishnan.

With such expectations of growth, selecting DB2 Universal Database as the data repository for the Web site was an easy choice, according to Balakrishnan. "We expect traffic on our Web site to more than double to three million visitors a month by the end of the year, yielding a 100 percent growth in revenue from online sales," he says. "The scalability that DB2 Universal Database ensures is very important." The gigabyte database stores product catalogs, customer profiles, inventory and order status.

Currently, the Web site resides on an IBM Netfinity server. Eventually, Balakrishnan anticipates that they will need to migrate to an RS/6000® server or any other UNIX®-based platform. "Because DB2 and Net.Commerce support multiple platforms, we'll be able to protect our development effort," says Balakrishnan. Initially, Rediff.com had considered another product. "But," says Balakrishnan, "when it came to upward scalability, DB2 and Net.Commerce made the most appealing long-term solution."

Promoting business relationships

Behind the scenes, it took considerable business acumen to convince other businesses — publishers, music companies, hotels and retailers — to participate in Rediff.com's Internet venture. "Though online sales represent a small fraction of their total sales, we convinced our partners that being the first to market would be key in the long run," explains Balakrishnan. On the Internet at least, familiarity breeds trust.

Rediff.com's high-tech operation is beginning to influence its partners as well. At present, Rediff.com manually updates its online store inventory, keying in information received in hardcopy from suppliers into its DB2 database. "In time, we hope to install DB2 at the suppliers' sites so that we can use its replication features to automatically synchronize inventory," Balakrishnan notes.

The sky is the limit

Are the returns from this venture commensurate with the investment? "Very much so," says Balakrishnan. "We'll recover what we've invested so far over the next two years. "And there's more to come. In the next phase of its business development, Rediff.com will open a fulfillment center in New Jersey, USA. "This will further reduce overseas shipment costs," Balakrishnan explains.

In April this year, San Jose, California will be the first of nine U.S. cities to have an events calendar aimed at the local Indian community. This service will subsequently be extended to Brussels, London, Singapore and Tokyo. Simultaneously, product prices will be listed in local currencies as well. "With Net.Commerce, we have the development tools to extend our Web services in innovative ways," says Balakrishnan.

The success of Rediff.com's online venture is generating interest in the Indian business community. Recently, Balakrishnan delivered a presentation at the National Association of Software Companies (NASCOM). "Everyone wants to know how we did it. I tell them that the technology was one part of it. The other was the commitment of the IBM experts here. We were among the first five installations of IBM E-Business technology in Asia, and truly, the IBM team was even more determined than we were that everything work perfectly."

Malaysian Electronic Payment System

Local payment consortium, Malaysian Electronic Payment System (1997) Sdn. Bhd. (MEPS) launched the first national Secure Electronic Transaction (SET) Payment Gateway pilot for Malaysia in late 1998. MEPS, a payment consortium representing 28 local financial institutions, was entrusted by Bank Negara Malaysia with the task of developing and implementing the national SET Payment Gateway as an integral component of the nation's E-Commerce infrastructure.

Taking the lead in this are Maybank and RHB Bank. As the only local payment consortium, MEPS already has an existing network infrastructure that has the capacity to cater for this strategic national project. The MEPS network infrastructure can be linked to other networks and computer systems established by various organizations other than financial institutions. This eliminates the issue of start-up costs that would arise if each bank were to set up their own gateway.

Initially, transactions can only be carried out using a VISA credit card issued by Maybank or RHB Bank during the pilot to enable MEPS to monitor the system itself and to collate data on the flow of E-Commerce activities that pass through the SET Payment Gateway. This year, it will be expanded to accept all credit cards from all banks that are credit card issuers, provided the cardholder has a legitimate digital certificate. This means that regardless of whom your bankers are, or what credit cards you carry, cardholders will then be able to make purchases over the Internet from any participating merchant.

IBM is MEPS's technology partner for this ground-breaking venture. IBM was selected because of its cutting edge technology and its worldwide commitment to the development of E-Commerce. Running on an IBM S/390 server and using IBM's award-winning Net.Commerce software and professional services.

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Company Background

For three decades, Intel Corporation has developed technology enabling the computer and Internet revolution that has changed the world. Founded in 1968 to build semiconductor memory products, Intel introduced the world's first microprocessor in 1971. Today, Intel supplies chips, boards, systems, software, networking and communications equipment, and services that compose the "ingredients" of computer architecture and the Internet. Intel's mission is to be the pre-eminent building block supplier to the worldwide Internet economy.

The Intelligent Way to e

Intel is developing smart building blocks to support E-Business. For example: agile connectivity, communications and networking solutions that integrate easily into existing networks, and with the new Intel® NetStructure™ family of products, equipment that enables the rapid deployment of services in the e-Business Data Center.

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Intel e-Business Networking & Communications Solutions Center

Give your business a competitive edge with Intel's scalable solutions that expand your existing networking infrastructure.

Reliability: You need to ensure availability and responsiveness, whether you're operating a corporate LAN or a high-traffic E-Commerce data center. Intel can help you make the most of your resources.

- For the LAN, Intel products feature built-in networking intelligence to prioritize traffic, alleviate bottlenecks and adjust to network conditions on the fly. By improving traffic flow, they allow today's rich new data types to pass through the network with better quality and faster delivery.
- For E-Commerce applications, products such as Intel's caches, traffic directors and load balancers are designed to improve responsiveness and assure customer satisfaction. Use them to reduce the impact of traffic spikes, direct customer requests to the most available server, or enable guaranteed service levels. Failover pass-through technology helps deliver uninterrupted service, 24x7.

Scalability: Intel products make it easy to rapidly scale your existing infrastructure in response to growth and change. Intel's scalable technologies include:

- Adaptive Load Balancing for server bandwidth aggregation
- Traffic management designed to balance growing Web site loads
- Scalable Stacking Technology that automatically increases the backplane for switch stacks
- Caching solutions with built-in clustering technology

You can enhance your switch functionality simply by adding new modules. Cascade multiple units as your traffic increases. Or upgrade your network adapters through software - reconfigure them simply by downloading new code instead of replacing them. From the network connection to the backbone to the data center, Intel helps give you the flexibility to address change without expensive over-provisioning.

Security: Whether it's IPSec on the LAN, SSL acceleration for the Web site or Virtual Private Networking (VPN) at the router/firewall, Intel can help you build the security solution you need. A multi-layer approach is recommended to keep pace with the security requirements of today's E-Business economy.

- LAN security such as IPSec at the desktop and server level
- SSL acceleration for rapid processing of secure online transactions
- VPN for access control and WAN/Internet security

With Intel products, you can add greater security without sacrificing your processing power. Intel's security adapters and E-Commerce appliances let you offload encryption/decryption from your servers, so you can use network resources more efficiently and maintain peak performance.

E-Commerce: Harness the power of the Internet with **Intel® NetStructure™** products for rapid deployment of intelligent E-Commerce services. With this growing family of products you have a wide range of flexible options for building E-Commerce solutions. Capabilities include:

- Web caching for faster content delivery and improved network utilization
- SSL offloading for faster processing of secure transactions
- Advanced traffic management and load balancing
- Setting guaranteed, error-free service levels
- Optimizing multi-site traffic so that customers reach the most available site
- Managing and accelerating secure XML transactions

High Performance: From non-blocking Gigabit switching to high-efficiency bandwidth management and security offloading, Intel products are designed for high performance even under peak load conditions.

- High performance begins with their Gigabit adapters for copper or fiber cabling
- Adaptive Load Balancing (ALB) built into Intel server adapters distributes outbound LAN traffic among multiple NICs to create the effect of a single, larger transmission pipe
- Intel also delivers high performance through their family of Gigabit Ethernet workgroup, segment and backbone switches
- Intel's modular Gigabit switch offers Layer 3, 4 and 7 capability for application-aware networking
- In the data center, Intel caching and traffic optimizing solutions provide faster content delivery and speedier online transactions

LAN Connectivity: The network connection is where devices and networks not only begin to get faster, but also where they begin to get smarter. Intel offers 10/100Mbps Fast Ethernet and 1000Mbps Gigabit Ethernet adapters designed for servers, desktops and mobile PCs, as well as connectivity solutions for remote access and network printing. Common drivers across all their adapters make configuration easier for you. And a wide range of onboard technologies increase network performance and manageability:

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- Auto-negotiation to the highest possible speed
- Packet tagging for traffic prioritization and QoS
- Adaptive Load Balancing for teaming multiple server adapters
- Security offloading to accelerate processing
- Wake on LAN for automated, after-hours management

E-Business Data Center Products

Intel offers a new breed of intelligent products that help increase reliability, security, flexibility, scalability and density of E-Business services.

Intel® NetStructure™ e-Commerce accelerators
Intel offers a family of e-Commerce accelerators that restore speed to servers running secure transactions by offloading the task of encryption/decryption, improving overall site performance, reliability and response time. Some e-Commerce accelerators even manage Web traffic among servers.

Intel® NetStructure™ 7110 e-Commerce Accelerator: Assumes the task of Secure Socket Layer (SSL) encryption/decryption, restoring server speed and boosting Web site performance by up to 50 times. This drop-in, scalable appliance processes up to 200 secure connections per second.

Intel® NetStructure™ XML accelerators
Intel offers a family of products designed for E-Business data centers which helps ensure that key Business-to-Business transactions receive timely and reliable service.

Intel® NetStructure™ 7210 XML Accelerator: This network appliance has the ability to intelligently read and quickly classify key XML information. It uses an advanced rules-based engine to manage the data center workload based on the XML request. Companies can carry out secure business-to-business XML transactions up to 50 times faster than previously possible.

Intel® NetStructure™ 7280 XML Director: It is the first device of its kind to combine the acceleration of security functions and XML control of transactions. Companies can carry out secure business-to-business XML transactions up to 150 times faster than previously possible.

Intel® NetStructure™ Traffic Management Equipment
Intel provides a family of E-Commerce traffic management solutions that automatically and intelligently balances traffic among servers or sites. They enable Web site managers to give top priority to fulfilling specific user requests and ensure responsive, virtual error-free performance for E-Business transactions.

Intel® NetStructure™ 7140 Traffic Director: A Layer 4 traffic management solution that uses actual response times to balance the traffic load across the server farm, improving site performance and reducing errors. Prioritized response times may be set for specific types of user requests, such as E-Commerce transactions.

Intel® NetStructure™ 7170 Traffic Director: Controls Layer 7 application/content, enabling priority error-free service levels to be set for specific customers or URLs. This traffic management solution uses actual response times to balance the traffic load across the server farm, improving site performance.

Intel® NetStructure™ 7180 e-Commerce Director: Assumes the task of Secure Socket Layer (SSL) encryption/decryption, restoring server speed and boosting Web site performance by up to 150 times. Traffic management using actual response times and Layer 7 control eliminates errors, enables site managers to prioritize secure traffic for all customers or URLs and balances traffic among servers.

Intel® NetStructure™ 7190 Multi-Site Traffic Director: Manages traffic across geographically diverse data centers, routing users to the best available site from a single URL. Offers a choice of efficient traffic routing methods so that requests may be sent to the fastest-responding site or to the "best" site based on server response time, amount of traffic, local conditions and proximity.

Intel® NetStructure™ 7340 Traffic Shaper
Intel recently introduced the Intel® NetStructure™ 7340 Traffic Shaper, a high-capacity, intelligent bandwidth provisioning and management solution. It allows Service Providers to manage network traffic more efficiently, deliver differentiated services and allocate bandwidth to suit subscribers' budgets and needs. The 7340 Traffic Shaper allocates WAN bandwidth to business-critical applications and limits non-critical or high-capacity applications. Flexible policies can protect subscribers' critical traffic and reports allow Service Providers to set, monitor and enforce Service Level Agreements (SLAs). Subscribers can select fixed or scaled bandwidth plans that cap usage at predetermined maximums based on demand.

The Traffic Shaper detects and classifies over 200 types of network traffic, analyzes the behavior and provides network reports. Reporting capabilities allow Service Providers to base capacity planning on concrete numbers and assess the impact of configuration changes. It also maintains logs on

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network traffic allowing administrators to recommend additional services to end clients.

Intel® NetStructure™ Cache Appliances
Key features:

- Industry-leading Inktomi Traffic Server Engine caching software integrated with Intel leading-edge platform technology
- Simplified setup and administration interfaces for fast deployment
- Streamlined 2U-high rack-mount design with built-in reliability features

The Intel® NetStructure™ 1500 Cache Appliance is a cost-effective method for improving bandwidth management and peak-load performance.

Maximize Bandwidth, Enhance Quality of Service: Enables more efficient use of frequently accessed information over the Internet, increasing the efficiency of your existing network and reducing the investments needed to support additional traffic. Also it greatly improves response times, even with variable backbone connections or during traffic spikes.

Intel® NetStructure™ Standalone Gigabit Switches
These new switches support up to four trunk groups with up to four ports per group, for resilient, redundant connections. These 8 port, standalone switches provide a non-blocking solution that eliminates bottlenecks and integrates easily with your existing Ethernet and Fast Ethernet infrastructure for greater connectivity with Layer 2 Gigabit Ethernet technology.

Intel® Internet Server Platforms
Key Features:

- 2U, 24" Rack-mount Design
- 4 Hot-swap RAID-capable Drive Bays
- Validated on Most Popular Operating Systems
- Advanced Intel® Server Control for Lifecycle of Product

Engineered for Service Providers, Dot.coms, and any company experiencing dynamic E-Business service growth, the high density Intel® ISP2150 Internet Server Platform provides powerful performance and high availability, with support for up to two Intel® Pentium® III processors and four RAID-capable, hot-swappable drives.

Customize to Your Environment: As your customer base expands and needs grow, the Intel® ISP2150 can be clustered, load-balanced and brought on line quickly. Unlike proprietary designs, the product's open, flexible architecture ensures a wide selection of choices at every level of the solution stack—from hardware components to the most popular operating systems, development tools and applications.

High Reliability for Maximum Uptime: In addition to remote, real time Intel Server Control, the Intel® ISP2150 includes hardware features such as four hot-swappable drive bays with add-in RAID controller to maximize uptime and assure data integrity for your customer.

Intel® Remote Access and VPN
The acquisition of Shiva Corporation by Intel Corporation was completed February 27, 1999. Now Intel's technology leadership in VPN, remote access, and internetworking systems helps provide leading network solutions for your business.

VPN Resource Center: The VPN Resource Center includes technical product information, VPN white papers, and examples of real customer implementations of secure, reliable remote access, intranets, and extranets with Intel's VPN solutions.

Direct Dial Products & Solutions: Intel's award-winning LanRover™ family of Direct Dial remote access products provides industry-leading performance at an affordable price. PC Magazine's Editor's Choice 5 years in a row!

Internetworking Products & Solutions: Intel's Integrator series of LAN-to-LAN internetworking solutions is a perfect complement to the award winning LanRover™ Series of Direct Dial and VPN remote access products.

Management Software: Intel's management solutions provide centralized, integrated access control, security, and user activity reports for both VPN and Direct Dial remote access users.

Intel® Express Routers
Intel Express Routers offer connectivity for branch and regional offices and smaller central sites. They provide:

- Easy Internet access
- Flexible configuration options, including single and dual WAN ports, single and dual LAN ports, and backup WAN functionality. Integrated CSU/DSU for T1 lines available on selected models
- Simple, easy installation and management
- Traditional Internet working with powerful WAN link management

These routers are specialized for efficient IP/IPX traffic handling. They include traffic control and security features, such as IPX/SPX spoofing and packet filtering. Advanced routing features and multiple management tools make Intel Express Routers an easy-to-use, cost-effective choice for reliable business communications.

Intel® 10/100/1000 Switches
A scalable family of Fast Ethernet and Gigabit products that let you migrate your network to Fast Ethernet one PC, one workgroup, or one network

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segment at a time. With Intel Switches, you can continue to support current Ethernet segments and legacy PCs even as you deploy dedicated Fast Ethernet and Gigabit connections to new segments, desktops, and servers.

Intel® Network Connectivity

Turn up your network's performance one PC, one workgroup or one network segment at a time. Intel's flexible and affordable solutions work with networks of all sizes and levels of complexity.

Intel® Desktop Adapters
Intel makes an award-winning line of Ethernet and Fast Ethernet adapters for networking your high-performance PCs. Choose from a variety of NICs designed to fit your network environment, whether you're ready to create a secure LAN, enhance desktop management, or just want flexible connectivity for your legacy PCs.

Intel® Mobile Adapters
Connect to the network quickly and easily with Intel® PRO/100 Mobile Adapters. These easy-to-use adapters combine reliable operation with high-speed connectivity, giving you quick access to email, the Internet and all your other network resources. They're simple to install and compatible with major network and PC operating systems. Choose a LAN card for local network connections, or a LAN+Modem card for local and remote access. Both are available in 32-bit and 16-bit versions, for high-performance or legacy notebooks.

Intel® Server Adapters
Give your servers fast, reliable, more secure network connections with Intel's award-winning line of server adapters. These Fast Ethernet and Gigabit Ethernet Server Adapters offer industry-leading performance plus advanced features to help reduce server bottlenecks and improve availability. Whether you're using a simple file server, a transaction-oriented database server, a corporate intranet server or an enterprise-wide application server, you can create connections that are more secure, aggregate bandwidth for higher throughput, establish redundant network links and enhance online serviceability through hot-swap capabilities.

Customer Testimonials

Exodus Communications

"Exodus Communications continues to enhance the solutions and technologies that it provides its customer base. By working with Intel, we offer the best network control e-Commerce solutions to our customers and strive to deliver the highest levels of reliability and performance to support the transactions of their end users." *Beverly Brown*, Executive VP & CMO, Exodus Communications.

Christian Books

"The Intel NetStructure products allowed us to have a very successful Christmas season, especially noteworthy in a year when some of the biggest players had well-publicized failures."

"The Intel products make a very significant contribution to our scalable model. If you need more power, you just keep adding servers. And if a server is ailing, it's easy to take it out of the load-balancing loop, service it, and put it back in. It's totally plug-and-play. These products paid for themselves during the 1999 Christmas season alone. We wouldn't have survived without them." *Mark Pepin*, Information Technology Manager, Christianbook.com.

Salesforce.com

"The Intel® NetStructure™ 7110 e-Commerce Accelerator is a big asset in selling our service. We're currently receiving about 150,000 application page-views per day, and we're using only 10 percent of the Intel NetStructure 7110 e-Commerce Accelerator capacity. There's so much headroom that we can easily scale to one million application page-views per day. Each Intel NetStructure 7110 e-Commerce Accelerator has easily saved us $10,000 in servers. As our business continues to grow, that savings makes a big difference." *Jim Cavalieri*, Vice President - Systems Engineering, Salesforce.com

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Microsoft®

Company Background

Since its founding in 1975, the Microsoft Corp. mission has been to create software that empowers and enriches people in the workplace, at school and at home.

Microsoft products include operating systems for personal computers and networks, server applications for client/server environments, business and consumer productivity applications, interactive media programs, and Internet platform and development tools. Microsoft also offers online services, personal computer books and input devices, and they research and develop advanced technology software products. Microsoft products are available in more than 30 languages and more than 50 countries.

Microsoft's early vision of a computer on every desk and in every home was recently updated to reflect the increasing role of the Internet in our lives. The March 1999 reorganization set the tone for a new company vision that will focus on customers and the power of the Internet, offering people and businesses the ability to be connected and empowered any time, anywhere, and on any device. As the world's leading software provider, Microsoft strives to produce innovative products that meet customers' evolving needs. The company's substantial investment in research and development, along with a firm belief in using customer feedback, enables Microsoft to offer technological advancements that ensure customers the highest-quality software products available today.

As of December 31, 1999, Microsoft employed 34,571 people - 23,542 in the United States and 11,029 in other countries. Of those employees, 14,433 are engaged in research and development. Microsoft's revenue was US$22.96 billion for the fiscal year ended June 30, 2000.

Microsoft's E-Commerce Strategy

The potential benefits of E-Commerce are clear: lower costs, greater reach, faster response times. But E-Commerce doesn't mean simply pushing products at people faster. Because the Internet is such a good communications channel—it's fast, reasonably reliable, low in cost, and widely accessible—it can also deepen relationships with customers and partners.

While the benefits of E-Commerce systems are enticing, developing, deploying, and managing these systems is not always easy. In addition to adopting new technology, many companies will need to reengineer their business processes to maximize the benefits of E-Commerce.

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Microsoft's E-Commerce strategy helps deliver a technology platform, a portal for online services, and a professional expertise that companies can leverage to adopt new ways of doing business.

Platforms are the foundation of any computer system. The Microsoft commerce platform is a foundation of technologies and products that enable and support E-Commerce. With it, businesses can develop low-cost, high-value commerce systems that are easy to grow as business grows. The Microsoft commerce platform's breadth is unmatched, ranging from operating systems such as Microsoft Windows NT® Server to application servers such as Microsoft Site Server Commerce Edition and Microsoft SQL Server™ to applications infrastructure and development tools such as the Microsoft Visual Studio® development system. The Windows® Distributed Network Architecture (Windows DNA) provides tight integration and easy programmability across this platform, helping businesses implement commerce systems quickly and with reduced risk.

Portals are the crossroads of the Internet, where consumers gather and where businesses can connect with them. More than 40 percent of Web users in the United States visit the MSN™ network of Internet products and services each month. Through MSN, Microsoft can help any business generate an awareness of demand for its products and services.

Partners provide customers with a wide range of choices for professional implementation services and tightly integrated software for Microsoft commerce solutions. Independent software vendors (ISVs) have created specialized commerce software components that extend the platform. Microsoft Certified Solution Providers, systems integrators, and Internet service providers deliver the expertise companies need to develop, deploy, and host commerce systems. To ensure success, the Microsoft Solutions Framework provides guidelines and best practices for how these partners and businesses can work together to implement these solutions.

Microsoft's electronic commerce strategy—platform, portal, partners—empowers companies of all sizes in all industries to build solutions that strengthen customer and partner relationships. The Windows 2000 platform reduces the costs to bring businesses on-line by delivering comprehensive functionalities and integration capabilities with your existing desktop and business systems.

Issues in Implementing E-Commerce

Although it is simple to describe their benefits, it is not nearly as easy to develop and deploy commerce systems. Companies can face significant implementation issues:

Cost. E-Commerce requires significant investments in new technologies that can touch many of a company's core business processes. As with all major business systems, E-Commerce systems require significant investments in hardware, software, staffing, and training. Businesses need comprehensive solutions with greater ease of use to help foster cost-effective deployment.

Value. Businesses want to know that their investments in E-Commerce systems will produce a return. Business objectives such as lead generation, business-process automation, and cost reduction must be met. Systems used to reach these goals need to be flexible enough to change when the business changes.

Security. The Internet provides universal access, but companies must protect their assets against accidental or malicious misuse. System security, however, must not create prohibitive complexity or reduce flexibility. Customer information also needs to be protected from internal and external misuse. Privacy systems should safeguard the personal information critical to building sites that satisfy customer and business needs.

Leverage Existing Systems. Most companies already use information technology to conduct business in non-Internet environments, such as marketing, order management, billing, inventory, distribution, and customer service. The Internet represents an alternative and complementary way to do business, but it is imperative that E-Commerce systems integrate existing systems in a manner that avoids duplicating functionality and maintains usability, performance, and reliability.

Interoperability. When systems from two or more businesses are able to exchange documents without manual intervention; businesses achieve cost reduction; improved performance; and more dynamic value chains.

Failing to address any of these issues can spell failure for a system's implementation effort. Microsoft's commerce strategy is designed to address all of these issues to help customers achieve the benefits of E-Commerce.

Microsoft's E-Commerce Platform

Microsoft has a strong history of developing platform products, and as a result has developed a great understanding of what a platform should deliver—a foundation for building solutions that are easy to develop, manage, and grow, and compliant with open standards. Microsoft's E-Commerce platform accomplishes these goals with several key building blocks: Windows-based clients for consumer and

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business access to the Internet; Windows NT Server and the BackOffice® family for server applications; and Visual Studio for applications development. Across these elements, the Windows Distributed Network Architecture provides the infrastructure for integrating and extending these platform elements and for leveraging investments in existing systems.

Windows and Commerce Clients

Windows provides consumers and businesspeople with access to Internet-based commerce applications. A variety of Windows-based initiatives are expanding the market for E-Commerce by widening the range of options and lowering the price for consumer Internet access. The Microsoft Windows CE operating system delivers Internet access for a number of consumer devices. The Microsoft Smart Cards for Windows platform provides secure storage for personal and payment information. Across this wide range of form factors, the Windows platform helps ensure secure, private, and inexpensive consumer access to the Internet. Specific examples of these benefits include:

Browsing Security. Consumers' privacy for Internet communications is enhanced when Web sites take advantage of Windows support for Secure Sockets Layer (SSL) - an Internet standard for encrypting information shared between browsers and Web sites.

Payment Security. The Passport wallet service facilitates E-Commerce by making it faster, easier, and safer for consumers to exchange credit card and address information with participating merchants from anywhere in the world. The server-side wallet enables consumers to enter their information once, and then provide that information to merchants at the time of purchase conveniently and securely. The Passport wallet service supports all common browsers and the consumer does not have to download or install any additional software.

Privacy. Personal user information can be shared securely using the Windows support for the Platform for Privacy Preferences (P3P). P3P is a new standard designed to enhance and encourage business-consumer personal information sharing by giving Web users the ability to control how their private information is shared online.

BackOffice

The Microsoft BackOffice server-application platform provides a wide range of products for implementing E-Commerce systems. The platform's commerce features—its ease of use, integration, and ability to interoperate with existing systems—are all the best of breed. The BackOffice products central to building scalable, robust commerce systems are: Windows NT Server for applications server and Web sharing; Site Server Commerce Edition for commerce site management; and Microsoft SQL Server™ for storing a company's product and customer information.

Windows NT Server: Windows NT Server is the foundation for Microsoft commerce applications. It delivers the ease of use and low cost that are the hallmarks of all Microsoft products. In addition, it offers the scalability and robustness required to support mission-critical commerce applications. Some of the world's largest online businesses—Dell Computer Corporation, for example—have implemented their E-Commerce systems on Windows NT Server.

Windows NT Server integrates technologies that simplify the development and deployment of commerce systems that, in turn, facilitate the integration of commerce systems with existing back-end commerce applications. Consequently, Windows NT Server promotes the interoperation of commerce systems with the trading applications of business partners.

Microsoft Transaction Server (MTS), a service of Windows NT Server, ensures the integrity of E-Commerce transactions. Significantly, MTS provides the technology to create and manage a scalable, shared, multi-user, multi-server processing environment. MTS virtually eliminates infrastructure coding and significantly reduces administrative overhead. As a result, E-Commerce systems can be developed more quickly and provide better performance, scalability, and reliability at run time.

Microsoft SQL Server: Database systems are the engines that manage the volumes of information required to run businesses online. Microsoft SQL Server performance, scalability, and tight integration with Windows NT Server and Site Server Commerce Edition make it very well suited for powering E-Commerce systems. For example, the SQL Server full-text search and English query give shoppers the power to search for products while using plain English, consequently enhancing their shopping experiences. SQL Server online and incremental backup and restore capabilities improve system availability and reduce management costs. Businesses can mine customer data by using the SQL Server Decision Support Server with Online Analytical Processing (OLAP).

Note that databases that store and manage E-Commerce information complement but do not replace a company's existing database systems. No conversion or migration of existing systems is required.

Site Server 3.0 Commerce Edition: Microsoft Site Server 3.0 Commerce Edition is the comprehensive commerce server for conducting business online. It

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provides the business intelligence for doing business online. Site Server Commerce Edition manages customer profile information and site personalization; supports marketing and ad campaigns; runs storefront operations (including catalog management and shopping cart functionality); and provides analysis tools to understand consumer behavior. Behind the scenes, Site Server Commerce Edition controls how all parts of a commerce system interoperate, managing Web site content, sending instructions and information to a database server, and exchanging key business documents with trading partners. Because Site Server Commerce Edition is designed around the Windows Distributed Network Architecture as a set of COM component frameworks and uses the building blocks of Windows interoperability, it is the easiest platform for corporate developers to integrate into their existing systems.

Visual Studio

Investments in development expertise are highly valuable to most corporations. Microsoft has made great efforts to protect these investments by standardizing programming environments across many languages. Visual Studio is the cornerstone of this effort and is of prime importance when developing E-Commerce applications. Visual Studio helps programmers get up to speed more quickly and transfer code and knowledge across applications more easily. Its strengths lie at the heart of commerce system development needs—Web content customization and management; user interface design; data access; integration with existing systems; and inter-application communications. Visual Studio includes the Visual Basic®, Visual C++®, Visual FoxPro®, Visual InterDev™, and Visual J++™ development systems. Visual Studio ensures that developers always have the right tools to meet their commerce development needs.

Microsoft's E-Commerce Portal

MSN–The Microsoft Network

Markets are where customers and vendors meet. One of the most well traveled markets on the Internet is the MSN network of Internet products and services. MSN gives consumers the ability to do online research, shopping, and buying for a wide range of products and services, all from one convenient location. Because more than 40 percent of Web users in the United States visit MSN each month, MSN can help any business generate awareness and demand for products and services with a large and qualified target audience. MSN advertising, partnership, and small business services help companies reach, build, and strengthen relationships with their customers. The Microsoft Online Sales Team can work with any company to find the best online opportunities to meet specific marketing goals.

Microsoft's E-Commerce Partners

Microsoft commerce partners are a critical element of the Microsoft commerce strategy. They provide customers with essential products and services for implementing commerce solutions on the Microsoft platform and portal. Customer choice and competitive pricing are the hallmarks of the Microsoft partner channel, the deepest and broadest partner channel of any software vendor. Commerce partners are no exception to this rule, and they provide support in four important areas: independent software development, Web development, enterprise development, and commerce hosting and operation.

Microsoft.NET

Microsoft is creating an advanced new generation of software that melds computing and communications in a revolutionary new way. The fundamental idea behind Microsoft.NET is that the focus is shifting from individual Web sites or devices connected to the Internet, to constellations of computers, devices and services that work together to deliver broader, richer solutions. People will have control over how, when and what information is delivered to them. Computers, devices and services will be able to collaborate with each other, instead of being isolated islands where the user provides the only integration.

Under the .NET vision, corporations will be able to interact more

efficiently and productively with their partners and suppliers. Their employees will find it very easy to get or generate information they need. Consumers will enjoy a simple, unified way to access the Internet, and manage the increasing number of devices they use everyday.

Case Study

Barnes & Noble, Inc.

Bookseller Barnes & Noble, Inc. needed to develop a Web-based E-Commerce solution quickly, so the company turned to Microsoft products to create a friendly, easy-to-access electronic storefront: barnesandnoble.com. With the benefit of a real-time shipping, order management, and financial reporting system based on Microsoft SQL Server™ 7.0 and Microsoft Site Server 3.0 Commerce Edition, barnesandnoble.com can serve customers in Internet time.

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Can a brick-and-mortar bookseller like Barnes & Noble, Inc., with a 125-year heritage and more than 1,000 superstores, successfully transition to the fast-paced electronic marketplace? The giant bookseller—with revenues of $2.8 billion in 1997—faced a formidable hurdle in moving to the Web nearly two years after its primary competitor. This new business model presented major technology challenges to Barnes & Noble, and the company's late start gave it little time to experiment. It needed to get a workable Web site—including a database that could manage millions of book titles and handle thousands of simultaneous hits—up and running fast.

Microsoft Helps Overcome Technology Hurdles

Utilizing its strong brand identity, innovative discount pricing structure, millions of titles from more than 50,000 publisher imprints, and a mastery of back-end distribution and fulfillment, Barnes & Noble used key components of a Microsoft E-Commerce solution to quickly create a friendly, easy-to-access electronic storefront: barnesandnoble.com. "Our close partnership with Microsoft helped us implement a scalable and robust E-Commerce site," says Carmella Cassetta, Vice President of Engineering and Product Development for barnesandnoble.com.

The company architected the site using a three-tiered approach. At the user-interface level sat the Web browser and server running Microsoft Windows NT® Server and its Internet Information Server technology. Secondly, the business logic tier included search, content, and transaction application servers running Internet Information Server and Microsoft Site Server Commerce Edition on Windows NT Server. Finally, SQL Server specifically manages the title information on the third tier.

After only two years in existence, barnesandnoble.com is one of the 25 fastest growing Web sites and one of the top five E-Commerce sites in the world. It is expected to deliver US$65 million in sales for 1998. Today, the company is enhancing its original system by transitioning the back-end services fulfillment systems to an online, real-time, Microsoft BackOffice® based shipping, order management, and financial reporting system called PRISM—or Pod Receiving and Integrated Shipping Management System.

PRISM will allow barnesandnoble.com to ship products much faster and deliver higher service levels to customers.

SQL Server 7.0 Improves Performance

By scaling to terabyte-sized multiprocessor clusters and with new scalability features such as dynamic row-level locking, intraquery parallelism, distributed query, and very large database (VLDB) enhancements, SQL Server 7.0 gives barnesandnoble.com the headroom needed for its ever-growing databases and history-recording requirements. "When we began beta testing 7.0, we saw a more-than-100 percent performance improvement with our fulfillment systems," says Alan Bourassa, director of Fulfillment Systems Planning and Design for barnesandnoble.com. "The storage and query engines are superb products, currently ahead of Microsoft's competitors."

The broader range of capabilities and improved stability in SQL Server 7.0 has impressed barnesandnoble.com. "We highly value its new data warehousing capabilities, including its significant query performance improvement and English Language Query function, which will make it easy for senior managers to obtain the information they need," remarks Tom Clarkson, Director of Fulfillment Systems.

Integration and Availability Key Advantages

At a higher level, the overriding advantage of SQL Server 7.0 for barnesandnoble.com is its seamless integration with other Microsoft products, such as Site Server Commerce Edition, that are critical to the company's back-end operations. "All the components of our back-end fulfillment systems are from Microsoft," Bourassa explains. "It is of major value to us to only have to go to one primary vendor for support of our entire BackOffice suite."

Further, with 24 hour, seven days a week operations, high availability and reliability are critical. That's another reason the company selected Microsoft SQL Server 7.0 and the BackOffice suite: with the fail-over capabilities of Microsoft Cluster Server, if one of the servers in its two clusters goes down, another can immediately pick up the load and continue processing. The company also uses disk mirroring or RAID 5.0 technology, depending on the performance required, and assures no downtime for maintenance by switching over to one cluster while performing maintenance on the other.

Greater Efficiency

When the complete Microsoft solution, with its integrated databases and functionality, is fully operational, it will allow barnesandnoble.com a potent competitive weapon with great efficiencies and smoother information flow.

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Novell®

Company Background

Novell helps organizations simplify and accelerate their transformation to E-Business by consolidating their multiple networks to create "one Net" - a secure and efficient foundation for conducting business inside, outside and between organizations. In the one Net environment, intranets, the Internet, extranets, corporate and public networks, wired and wireless networks all work together across the leading operating environments to give companies the power and flexibility they need to succeed in the Net economy. Novell is making one Net a reality with their Net services software and advanced framework for deploying directory-enabled solutions that allow organizations to build electronic relationships among employees, customers and business partners.

In fiscal 1999, the company reported revenue of US$601 million and net income of US$68 million. For the first six months of fiscal 2000, Novell reported revenue of US$618 million and net income of US$76 million.

Taking E-Business to the Next Level

E-Business Executives are responsible for leveraging every aspect of their organization - people, processes and systems - in order to drive revenue, increase productivity and enhance service. The network, in all its forms, will serve as the new strategic platform for businesses. But the complexity of today's network environments, from multiple platforms and legacy systems to an endless stream of new technologies, make managing networks - and organizations - more difficult than ever.

To compete in both the traditional and digital marketplace, you need new ways to serve a growing community of users, including employees, partners and customers, while ensuring the security of the enterprise.

Net Services Software - Your Competitive Edge in the Digital Economy

Novell envisions a world in which all types of networks work together as one Net to provide organizations with the power and flexibility they need to succeed in the Net economy.

Novell's Net Services software is bringing this vision to life. It secures and powers all types of networks - intranets, extranets and the Internet; corporate and public; wired to wireless - as one Net.

With Net Services software, your IT staff controls the policies and privileges for accessing all Net resources. As a result, you get a secure E-Business platform that improves the experience of all users. Employees, partners and customers can safely connect, communicate and collaborate from anywhere on the Net.

You also increase the productivity of your IT department, since Net Services software enables you to utilize all of your existing hardware and software to keep your network state-of-the-industry. As the technology environment evolves and changes, your E-Business can quickly adapt so you can capitalize on new opportunities.

Novell - A Proven Partner

In choosing Novell, you'll be working with a company that currently serves 81 percent of the Fortune 500®, powers more than 3.8 million servers and supports in excess of 80 million users worldwide.

Novell understands that to provide customers with total IT solutions, partnering is essential. That's why they've developed alliance partnerships with the best companies in the industry, including 3COM, Cisco Systems, Compaq, Dell Computer Corporation, Deloitte & Touche, IBM, Intel, Lucent Technologies, Oracle, Perot Systems, Sun Microsystems and marchFIRST. And because Novell enjoys the support of more than 27,000 channel partners and 40,000 independent software vendors (ISVs), their solution will be implemented and customized by experts familiar with the IT demands of your industry.

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E-Business Architecture

DENIM

The foundation of Novell's strategy is the **Directory-Enabled Net Infrastructure Model (DENIM)**. Through DENIM, Novell and their industry partners will provide Net services that are:

- **In-the-net** - Become part of the Net, performing persistent and specific roles that bring value to people, processes and applications
- **Universal** - Provide that value across internal and external networks (as one Net), consistently and securely
- **Modular** - Draw upon and integrate with other services through open standards. Leverage and inter operate with existing network services and other IT investments
- **Cross-Platform** - Work across all leading operating environments rather than within a particular Operating System alone

DENIM and its eDirectory foundation support three classes of services:

- **Management Services**, such as the ZENworks™ products and DirXML
- **Content Services**, such as information publishing, storage, and delivery services
- **Portal Services**, such as iChain, which provides a foundation for business-to-business (B2B) and business-to-consumer (B2C) E-Commerce applications

Technical architecture for DENIM includes directory services, a policy engine, event services, licensing services, authentication services, and application access via LDAP, JavaBeans, and XML through the Novell Developer Kit (NDK).

E-Business Infrastructure Products

Directory Services

DirXML

DirXML enables organizations to easily link and manage user profiles across divergent platforms and networks.

NDS Corporate Edition

NDS Corporate Edition is a cross platform solution that integrates corporate resources across your network enabling your E-Business to simplify network management, enhance the user experience, and lower IT costs.

NDS® Corporate Edition is a directory-enabled solution to create a seamless, unified network from heterogeneous systems. Corporate Edition integrates Windows NT, Sun Solaris, and Linux user management functions into NDS eDirectory so that you can easily and inexpensively manage a network comprised of multiple platforms and operating systems.

NDS eDirectory

NDS® eDirectory™ is a stand-alone, cross-platform LDAP directory service that powers E-Businesses. It provides the foundation to grow your business by building and maintaining secure and highly customized E-Business relationships while leveraging your existing technology investments. With eDirectory, you can create customer loyalty by offering new applications and services based on highly personalized user profiles and user behavior.

Novell eGuide

Novell eGuide is a Web application that lets you easily and quickly search for directory based information. It provides you a single location to search for the people, place, and things you need to know.

Novell Single Sign-On

Novell Single Sign-On eliminates the need for end users to manage multiple passwords and saves your organization money by significantly reducing password-related help desk calls and redundant password administration.

Schemax

With Schemax you can step in and take control of your NDS™ environment. Using the included tools, you can access and modify various components of the NDS schema.

Network Operating System

NetWare® 5.1

NetWare 5.1® is based on open standards providing fast, secure, and efficient integration between your business network and the Internet.

While capitalizing on the strengths of NetWare® 5, NetWare® 5.1 integrates new Web and application server technologies that extend your organization's reach into the world of E-Business and Web-based network management. Tools such as IBM WebSphere Application Server 3.0, Standard Edition and NetWare Enterprise Web Server simplify the once intricate processes of Web application development, deployment, and management.

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New administrative features make NetWare® 5.1 an attractive choice for any network administrator. Using the power, scalability, and security of NDS® eDirectory™, you can strengthen your business relationships without having to worry about the safety of your data. ConsoleOne™ and ZENworks™ Starter Pack provide improved administrative options, while NetWare Management Portal™ actually enables you to perform server and file system management tasks from any Web browser on your network.

Support for Microsoft Office 2000, open standards, strong security, and an outstanding developer toolset combine with Internet and intranet technology to make NetWare® 5.1 one of the best platforms for deploying powerful, Web-based applications.

Software

Novell® BorderManager Enterprise Edition

Novell's security suite helps businesses protect their systems and strengthen network borders, provides integrated protection against internal and external threats, secures customer, partner, and employee Internet and remote access to company data, while improving Internet browsing efficiency.

Novell® BorderManager™ Enterprise Edition (BMEE) is the complete Internet security management suite with which businesses can leverage the power of NDSTM on NetWare®, NT, and UNIX networks. This standards-based suite allows organizations of all sizes to cost-effectively deploy industry leading firewall, authentication, virtual private network (VPN), and caching services for comprehensive security protection. Taking advantage of tight integration with NDS, BMEE is the first security management solution to deliver secure single sign-on for users accessing confidential company information from the Internet or an intranet or extranet.

BorderManager Enterprise Edition 3.5 comprises:

- BorderManager Firewall Services 3.5
- BorderManager VPN Services 3.5
- BorderManager Authentication Services3.5.

ConsoleOne™

ConsoleOne™ is leading the way in providing new power and flexibility for development and deployment of intelligent network management solutions. It delivers 100% Java-based GUI management to the Netware server console and client desktops.

ConsoleOne™ 1.2c is a free, versatile Java utility that you can use to manage your network and its resources. It has a user-friendly interface and can run on a Windows workstation or a NetWare server.

iChain

iChain is a secure open framework for busines to business solutions providing extranet access management, security, and transaction engine using eDirectory as a foundation for digital communities.

ZENworks

The Novell ZENworks product line balances the need to control user and IT staff efficiencies, resources, and management costs with the need to confidently extend and personalize business processes to employees, customers and partners. Directory-enabled and policy-based, ZENworks products provide the highest levels of automation, personalization, security and control for an end-to-end management solution that enhances users' quality of experience in an increasingly competitive and opportunistic economy.

E-Business Infrastructure Services

Novell Consulting

Most companies these days are so busy fighting fires that management finds it impossible to locate the time and talent needed to convert business strategies into sound practices that work. Since deploying new technology is essential to maintaining a competitive edge, Novell Consulting and their business partners can jump-start your organization with the rapid deployment of business solutions that differentiate your company from the competition.

For example, Novell DirXML allows organizations to seamlessly link and manage all the places where business and network information is stored without changing ownership of the information. That information is then available to the Web and the next generation of cross-functional electronic business applications to help grow your business.

Novell Consulting employs some standard principles that they focus on when providing professional services:

- Proven advice from their best practices and methodologies
- Risk assessment and reduction
- Automation techniques and tools to reduce implementation time
- Solutions that leverage NDS (reducing network management and operation costs)
- Knowledge transfer from product experts
- Design, planning, and implementation

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Novell Consulting is not for everyone. It's for businesses that set aside conventional routine and raise themselves to a higher level of performance.

Methodology Overview: Novell Consulting employs methodologies to deliver a structured engagement that addresses your specific business goals. Their methodologies are based on proven processes designed to ensure the best results for optimizing your business processes, shortening deployment times, minimizing risk, and maximizing your investment. These processes help them develop a solid understanding of your project objectives, engage in proper planning, establish good communication, and correctly apply technology to satisfy your IT requirements. By engaging Novell Consulting, you gain the advantage of work backed by proven methodologies and ensure that your expectations are met.

Case Study

CNN Interactive

CNN Interactive selected Novell's NDS eDirectory(tm) to support the delivery of personalized content to its millions of worldwide users. The Novell software enables CNN Interactive to store the interests and preferences of visitors to its Web site and then use these "digital profiles" to automatically provide a Web experience personalized for every visitor.

As part of CNN Interactive's "Web farm" infrastructure, NDS eDirectory runs on Novell's NetWare 5 intelligent network server platform. This highly scalable Novell E-business solution gives CNN Interactive the ability to store digital profiles on millions of Web visitors. In addition, CNN Interactive uses the Novell software to conveniently manage this critical information from a central Java-based console.

Based on open Internet standards, the cross-platform Novell software also runs on Sun Solaris, Windows NT, and soon Linux platforms, giving E-Businesses like CNN Interactive the option of hosting their directory solution in their server environment of choice. This cross-platform capability also gives CNN Interactive the option of mixing different server environments in the same NDS structure for suitability to task.

"We use NDS to make the Internet experience personal and more rewarding for our users," said Monty Mullig, vice president of CNN Internet Technologies. "NDS eDirectory allows us to tailor content and services to the individual needs of our users. We deliver nearly seven billion page views to our Web sites each year, and NDS is able to provide the performance to sustain this high volume of traffic."

CNN Interactive demonstrates how the world's most popular Web sites are using the power of directory-based solutions to provide users with a more personal and productive experience. At heavily visited Web destinations like CNN Interactive, NDS eDirectory provides the basis for trusted relationships that are a key to brand loyalty and business growth on the Web.

In addition to its proven reliability and scalable performance, NDS eDirectory provides E-Businesses like CNN Interactive with flexible data management capabilities not available from other LDAP directories or relational database solutions. The hierarchical structure of NDS eDirectory makes it fast and easy for CNN Interactive to analyze and modify how they store user information. In addition, NDS eDirectory allows CNN Interactive to automatically replicate user information across multiple servers for greater accessibility, reliability and ease of data management.

Novell's Consulting Services and Pre-Sales Systems Engineering worked with CNN Interactive to design, plan and implement the integration of NDS eDirectory with Web servers. Novell Consulting specializes in the rapid deployment of directory solutions that reduce network management costs and speed the integration of diverse systems in large customer networks, including E-Businesses such as portals, service providers, media outlets and online retailers.

About NDS eDirectory

NDS eDirectory is a stand-alone, cross-platform LDAP directory service that powers E-Businesses and networked information environments. NDS eDirectory enables businesses to build and manage secure and customized relationships with customers and partners who want to use the Web as a primary channel for conducting business. In addition, NDS eDirectory supports new applications and services based on highly personalized user profiles, personalities and behavior.

About CNN Interactive

CNN Interactive is responsible for the award-winning news site CNN.com, as well as eight other Web sites and the distribution of CNN news content via other platforms such as PageNet pagers and iMagic's PowerPhones. In February 1999, CNN Interactive launched CNN Mobile, the most comprehensive and advanced 24-hour global and pan-regional news and information service for GSM mobile phones. The CNN Web sites, which include CNN.com, CNNfn.com and CNNSI.com, are among the world's leading news and information Web sites. The CNN Web sites average more than 556 million page impressions a month and have served more than six billion page impressions from January through November 1999.

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ORIGIN

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ORIGIN

Company Background

ORIGIN is a global IT services and consulting firm with over 18,000 employees around the world. ORIGIN provides a full spectrum of business and IT solutions for global corporations and other complex extended enterprises through operations in 32 countries. A leader in enterprise outsourcing, ORIGIN is represented by over 1,300 professionals in major Asia Pacific countries such as Australia, China, Hong Kong, SAR, India, Japan, Malaysia, Taiwan, Thailand and Singapore (Asia Pacific Headquarters).

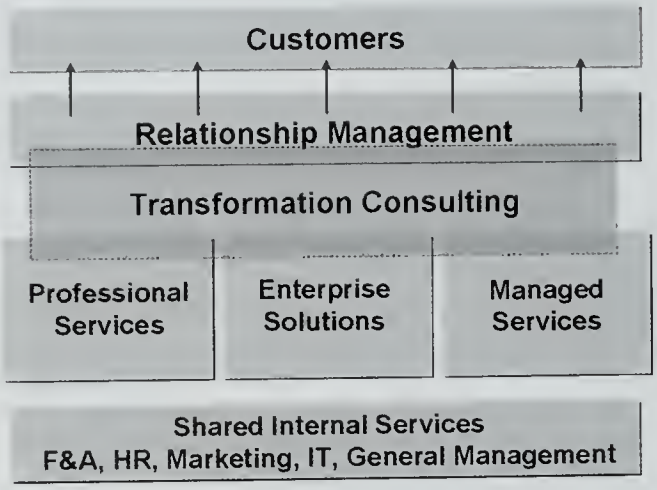
ORIGIN's unrivaled track record includes expertise in a number of industries including process manufacturing, oil & gas, chemicals and pharmaceuticals, high-tech electronics, consumer packaged goods, and banking and finance.

Annual revenues of around US$2 billion were achieved in fiscal year 1999. The company maintains headquarters in the Netherlands, U.S. and Singapore, and is a member of the Royal Philips Electronics group of companies.

ORIGIN is able to deliver full lifecycle solutions and services to their customers, ranging from consulting, implementation, development, installation, managed operations, maintenance, helpdesk and support. Bundled with ORIGIN's strong global presence and unique focus on employee and customer relationships, ORIGIN has continued to see growth in all their target markets.

Main Business Activities

ORIGIN operates with a customer-driven matrix structure:



Enterprise Solutions

ORIGIN's Enterprise Solutions deliver an integrated industry-based, enterprise-wide solution encompassing ERP (Enterprise Resource Planning), CRM (Customer Relationship Management), SCM (Supply Chain Management) and MES (Manufacturing Execution Systems) based on best-of-breed specialized function solutions. ORIGIN consultants help re-design or re-align the business processes, implement solutions, train the users, roll-out to multiple sites or multiple countries worldwide, manage the entire project and the change processes. In line with the E-Business trends, ORIGIN's latest packaged solutions for the enterprise are web-enabled and cover both business-to-business and business-to-consumer functionality.

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Professional Services

ORIGIN's Professional Services portfolio is wide ranging and includes Consulting, Application development services and E-Commerce services. The Professional Services group specializes in providing customized solutions to meet the unique needs and precise requirements of clients. With ORIGIN's ability to understand and integrate the various components of their customers' business and IT ecosystem, the customer is well positioned to take advantage of the next wave of innovation to gain the competitive edge.

Since 1999, ORIGIN has placed added emphasis on emerging technology areas such as E-Business, ERP Second Wave arenas (i.e. CRM, SCM, etc.,), Outsourcing and Knowledge Management. Last year, ORIGIN acquired a team of about 50 E-Commerce professionals in the US who are now leading the E-Commerce initiatives globally.

Managed Services

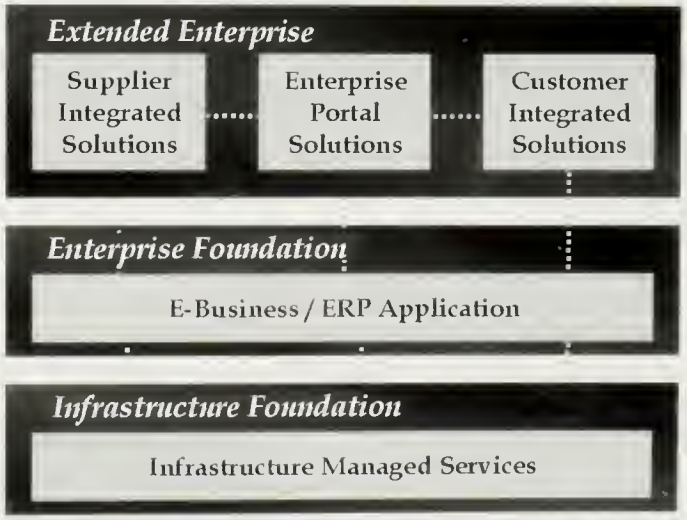
ORIGIN's Managed Services comprises IT infrastructure management, Managed operations, Application support, Enterprise systems management and Customer support services. Managed Services provides ORIGIN's customers the flexibility of reorganizing their structures across geographies, time zones and functional areas, thus allowing more agile business set-up and operations.

ORIGIN's solution is based on EMS (Enterprise Management Systems) which is designed for 24-hour 7 day-a-week coverage of business critical systems. This means operational stability and reliability for your business, both enterprise-wide and internet-wide. This also includes the ORIGIN Support Center, which provides "Follow-the-Sun" telephone support globally.

Managed E-Business Services

ORIGIN helps companies to manage and run their E-Business models. As a reliable partner to your business, ORIGIN provides secure and high performance infrastructure solutions needed to complement today's critical E-Business applications. Their proven models and methodologies will help shorten the time to market whilst maintaining the competitive advantages in this rapid changing environment.

ORIGIN provides round-the-clock operation and infrastructure support for critical E-Business systems. Their world-class data centers, disaster recovery centers and monitoring automation tools provide a stable, controlled environment for mission-critical systems at guaranteed service levels. End-user and management support services, including helpdesks, problem and change management, are delivered on a consistent, coordinated basis in accordance with ORIGIN Service Delivery Methodology (OSDM) based on ITIL and ISO 9001 certification.



ORIGIN succeeds by increasing the value of their customers' extended enterprise through creative use and ongoing management of information technology. ORIGIN helps a company extend the boundaries of its technology so that it touches its customers, suppliers and vendors, using approaches such as Supply Chain Management (SCM) which incorporates a complete E-Business perspective of business processes. ORIGIN's Infrastructure Managed Services would be the foundation whereby mission critical, transaction E-Business or ERP systems are managed securely and reliably.

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The four main focus areas of ORIGIN's Managed Services are as follows:

- Enterprise Infrastructure Management (EIM)
  - Server Management
  - Network Management
  - Desktop Management
- Enterprise Application Management (EAM)
- ERP Outsourcing
- E-Business & Messaging

Enterprise Infrastructure Management (EIM)

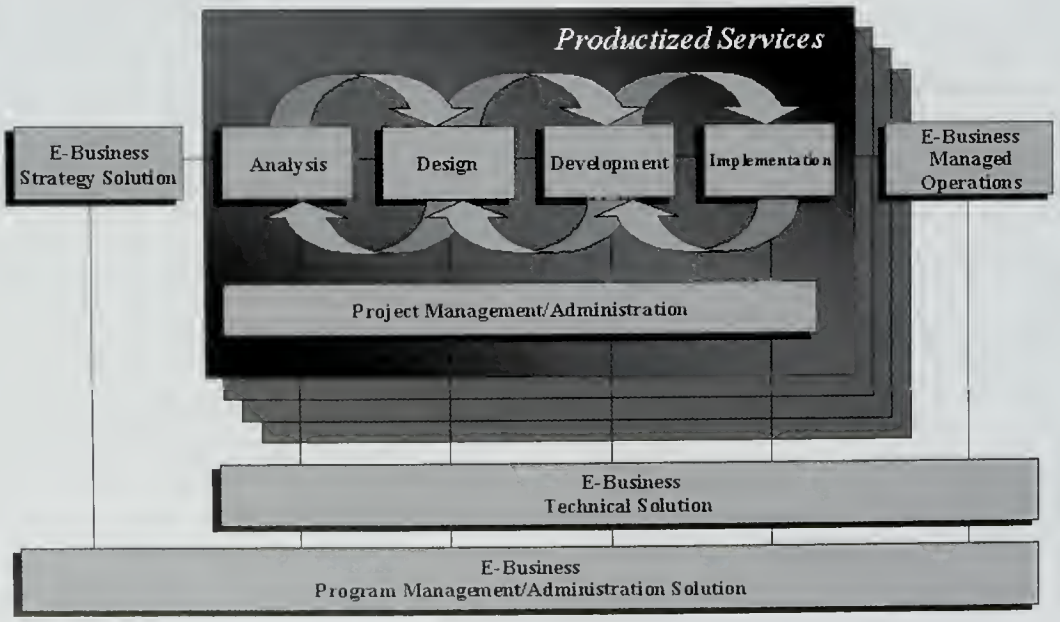
Enterprise Infrastructure Management is aimed at solving or improving specific business issues. The set of services covers all components of an IT infrastructure and combines ORIGIN's Global Enterprise Management Solutions technology with system management services to provide end-to-end IT management for enterprises.

EIM is constructed from Server, Network and Desktop Management elements. These in turn are scaleable through the addition of selected options to the defined "Core Services" which allows EIM to offer real business value. As with all ORIGIN products, it can be delivered worldwide in a standardized way. EIM is also designed to be easily combined and integrated with other ORIGIN services into their full IT lifecycle management suite.

Enterprise Application Management (EAM)

Listed by independent analysts as one of the world's top global IT services companies, ORIGIN is one of the few full Enterprise Application outsourcing service providers. A comprehensive service portfolio includes proven expertise in deploying, maintaining, operating and upgrading business systems on a local, regional, and global scale. All services are available globally and seamless consistent delivery is assured by their global service methodology: the ORIGIN Service Delivery Model (OSDM).

ORIGIN has over twenty years' experience in deploying new applications and maintaining business systems throughout their life. As a result, aligning IT with business processes, an aspect that is critical to success, is another strength. With a wide range of skills, experience and expertise in Enterprise Applications, ORIGIN is well equipped to assist customers in adapting to new business management philosophies.



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ERP Outsourcing

Prominent IT research firms have recognized ORIGIN as a leading Information Technology provider that can offer ERP Outsourcing through the entire ERP life cycle – from the business consulting phase, analysis and selection, implementation and integration, to ongoing managed services.

As a pioneer in ERP Outsourcing, ORIGIN offers a full range of post-ERP implementation services including:

- Business Improvement Consulting
- Multi-site roll out of ERP systems
- Upgrades and migration to new releases
- Migration to new solutions (e.g. BPCS to SAP)
- ERP Maintenance and Helpdesks
- Development of new functionality, interfaces to other applications and reports
- E-Business integration with ERP
- ERP software factory approach (such as ABAP)
- ERP system management including system operations, systems performance and database tuning
- ERP systems integration with bolt-on packages
- ERP application support
- Project team and end-user training
- Change Management

E-Business and Messaging

In December 1999, ORIGIN Singapore signed an MOU between Suntec City, Starhub Internet and Singapore-One to provide a plug and play environment for the premier E-Business hub in Singapore. ORIGIN is currently extending this offering to other premier E-Business hubs in the region.

Features of the Networking Infrastructure

High availability, "plug and Play" Firewall and Internet Service through a shared setup

Flexibility to allow state-of-the-art management with tools for the following: Shared/dedicated DNS; Proxy; SMTP Relay; Web servers; Database servers; Application servers

Security, with external connections (Internet) separated from Internal connections (customers or Third Party Suppliers).

Redundancy, so that any single Firewall downtime does not affect any user/customer.

Scalability, Connected to multiple customers Networks (either LANs or WANs).

Internet Access, 155Mbs ATM connection, redundant 100MB Internet Isolation LAN to share between multiple customers.

Supported Telecommunication vendors, ability to work with multiple global and regional telecommunication players.

ORIGIN Managed E-Business Services offers the following comprehensive portfolio of IT services for your E-Business needs:

E-Business Infrastructure Consultancy

- Sizing / Feasibility Study
- Project Management
- Training

E-Business Application Hosting

- Managed Application Support Services
- Application Content Management
- Incubation Services
- Application Portal Hosting (for ASPs)
- Application Production Control Management (Software Engineering Factory)

E-Business Data Center Co-location Services

- Plug-and-play modular physical space
- World-class Facility Management using state-of-the-art management tools like Tivoli, Computer Associates TNG, HP Openview, Netscout, Appscout, Webtrends
- Fully redundant telecommunications, power, security and system management
- Web server Change and Configuration Management
- Web server Security Management
- Web server Capacity Management
- Physical Database Management
- Web server Performance Management
- ISP Management
- Asset Management
- Proactive Availability Monitoring (URL Monitoring)
- Full 7 x 24 hours, Local Support or "follow-the-sun" Global Support

E-Business Infrastructure Management

- Security Management Services (Firewalls, Networks, Application)
- eNetwork Management Services
- Internet/Intranet/Extranet Solutions (Intranet Hotel) – eSCM, eCRM, EDI and ERP web integration solutions

E-Business Helpdesk and Web Reporting

- 7 x 24 x 365 Helpdesk
- Web Reporting

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E-Business Disaster Recovery Solutions

- Cold/Hot Disaster Recovery Services
- Redundant Web Services
- Redundant Network Availability Services
- Secure Onsite or Offsite Tape Storage

ORIGIN's Strategic Differentiators

ORIGIN is focused on meeting, and exceeding, the needs of their customer's business. Together with their customer, they establish a partnership. Key to this approach is the consideration of the customer's financial needs and concerns. Through this ORIGIN is able to plan and deliver the financial performance and service levels that will enable a business to thrive and continue to stay competitive in an ever more demanding E-Business world. ORIGIN will:

- Ensure business continuity even during periods of major change
- Drive business and technology innovation to improve competitiveness
- Guarantee best-of-breed solutions in concert with business goals
- Fuse business requirements with technological solutions
- Leverage E-Business opportunities to improve revenue and profitability
- Share information ensuring customer involvement at all key stages
- Leverage ORIGIN's proven expertise, skills, services and alliances

Customer Focus: With 1,300 skilled professionals in the Asia Pacific region and over 18,000 in 32 countries in the world, ORIGIN is able to identify potential problems in advance, ensuring high levels of performance and henceforth strong customer satisfaction at all times.

Vendor Independence: Based on their strong relationship with alliances and partners, ORIGIN's key differentiator is the ability to work independently with various hardware, software and networking vendors for the best-of-breed industry solutions for customers.

Technology Depth and Breadth: ORIGIN is able to provide the full end-to-end infrastructure and applications support services through a single point of contact to customers whether locally, regionally or globally, giving the customers added value and choice in choosing their preferred IT partner.

Using only the latest management and integration tools, ORIGIN is able to provide a high degree of pro-activeness in managing the customers' IT environment, be it for the desktops, servers, networks, traditional or E-Business applications.

Return of Investment: ORIGIN will help maximize your ROI by uncovering the potential of your E-Business system. The service provides a continuous performance measurement with ongoing improvements to your E-Business system, helping you to increase your E-Business availability and utilization.

To enjoy the real value of your E-Business investments, ORIGIN looks forward to work with clients on a variety of flexible pricing schemes (fixed monthly pricing, transaction volume pricing, extended client pricing) that would only work in this new E-Business world. ORIGIN's initiatives of shared-risks shared-rewards will further help to maximize your return on investment.

Partners: ORIGIN will be your trusted partner and sole contact source on helping you to run your E-Business systems effectively. With a track record of more than 20 years in IT services, they provide the most flexible and scalable services to grow together with your E-Business needs and successes.

Sample Customers

Customer	Project Details
An international Insurance company	Hosting, operating and managing the Asia Pacific E-Business systems and Networking requirements of one of the top ten insurance companies in the U.S.
Online stockbroking firms	Hosting, operating and managing large transactional volume (expected user registration of up to 200,000 users) E-Business servers / networks for some of the larger stock-trading houses in Singapore
A global Telecommunication company	Hosting and operating 7x24 a global telecommunication company's equipment in Singapore
A B2C E-Commerce company	Hosting and operating an Asia Search Portal
A global Electronics giant	Managed operations for all the Firewalls located across 8 countries in Asia Pacific

* Further information can be made via a written request to one of the persons listed in the contact information section.

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INPUT Services For IT Decision Makers

INPUT conducts a variety of research-based projects for decision makers. These projects focus on topics of high and immediate value to IT decision makers. The value proposition of these projects is that they are based on original research as opposed to opinion.

Projects cover the following IT and business sectors:

- Electronic Commerce
- Electronic Banking
- Electronic Government
- Enterprise Application Solution
- Internet & Intranets
- IT Customer Services & Support
- IT Operational Services

INPUT's decision maker projects:

- Enable vendor selection based on organised data from research with active buyers and users
- Support buying decisions on systems, software, services and processes
- Provide data, analysis and advice for strategic and tactical planning
- Support communications on industry developments and strategies with users, vendors and management

In addition, INPUT offers the following services:

- Extensive analysis and assessments of the world's leading IT vendors
- Comprehensive programmes of market forecasting for all leading IT markets worldwide
- Custom research projects
- Client presentations

Contact your local INPUT office (see back cover) to find out how you can use our services, knowledge and experience to grow and profit in the revolutionary IT world of the 21st century.

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